

# **AIRFIX** magazine

NOVEMBER 1970

## **FOR PLASTIC MODELLERS**

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**IN  
THIS  
ISSUE**

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Heinkel He 111 H-22 model with V-1 bomb**



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Bottom left: World War I tank Bottom centre: Lee/Grant tank Top left: 88mm Gun Right: Centurion



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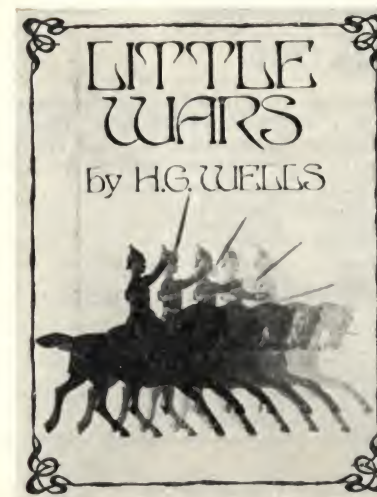
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1967: December—Hallfax II conversion. 1968: October—Lancaster II conversion. November—British tank markings. December—Churchill Crocodile. 1969: February—Hereford conversion. March—Sherman BARV. April—Sopwith Pup and Mk V tanks. June—Danish Catalinas and panzer uniforms. July—'Battle' class destroyers. August—Fairey Fulmar conversion and JS3 details. September—Avro Manchester conversion. October—'Flower' class corvettes and Ventura conversion. November—Sandringham and O-Z class destroyers. December—Grant and Dakota conversions. 1970: All issues except January, March, September.

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"H. G. Wells was, of course, fascinated by the science of war, as reflected in many of his other books. As he indicates in Chapter II of this book, he had been 'playing with' toy soldiers and spring-loaded cannon since at least the eighteen-nineties when good scale lead soldiers first became generally available. He soon brought his considerable imagination to bear on the formulation of simple but effective rules to rationalise the small boy's pastime of shooting down toy soldiers with toy cannon. He did it so well that he nearly brought the hitherto inanimate lead soldiers to life—or perhaps that is the effect on the reader of Wells' charming prose and J. R. Sinclair's delightful 'nursery floor' drawings which decorate the pages in such pleasant variety.

"The rules set out in *Little Wars* form the basis of most of the rules set forth with much refinement and expansion in later books on the subject. Times change, as do the model soldiers and their equipment. The tendency today is to use the smaller 00/HO size plastic soldiers and little guns which do not actually fire shells—instead their effect is determined by dice throw. I still have a sneaking preference for guns which really fire little lead or plastic shells, however, and while this new edition of *Little Wars* was in preparation I greatly enjoyed re-fighting the Battle of Hook's Farm (or something very like it), on the floor, surrounded by Britains plastic soldiers, and using Wells' rules to the last letter.

"For years it has been a rare collector's piece, available occasionally in a few libraries but otherwise extinct as far as the general reader or wargames enthusiast was concerned. Because of the basis of all present day table top (or floor) battles, I am delighted that it is once again available to a wider public than ever before and for those who do not actually indulge in wargaming, it remains a delightful period piece from the more leisurely age before the two world wars. *Little Wars*, in short, is not just a wargames manual—it is a book of great charm and essentially one to keep."

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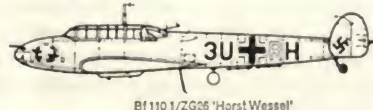
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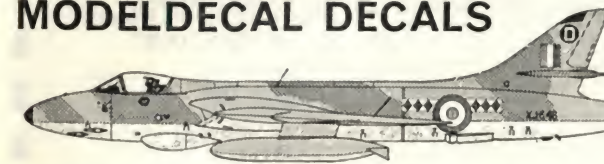
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H.S. Harrier GR.Mk.1. XV744, 1(F) Sq. Late 1969  
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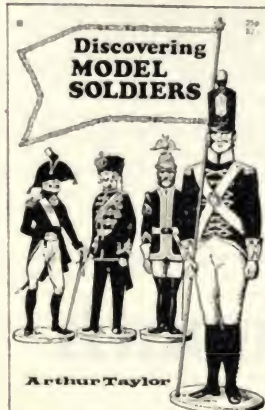
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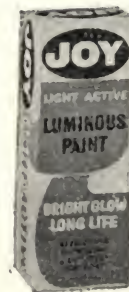




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## AIRFIX magazine FOR PLASTIC MODELLERS

November 1970

Volume 12 No 3

Editor Chris Ellis

#### Cover Picture

Spitfire patrol, 1940. The best-known of warplanes needs no introduction, and this painting depicts machines of No. 66 Squadron, RAF, as they appeared in October 1940 in the latter period of the Battle of Britain era. Nearest is N3043 : L2-K, a Mk I. Artist R. Williams has attempted here to portray the typical scruffy appearance of a 'war-worn' aircraft with dirty oil-stained paintwork and bare metal showing through in particularly worn areas. This sort of effect can be managed quite well on a model if not overdone.

(Photo by B. Baker from a painting by R. Williams)

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# THE FLYING JEEP

Attractive airborne forces prototype  
described and modelled by  
Geoffrey W. Futter

IN 1942, when the airborne forces were rapidly expanding in readiness to take part in the operations being planned for the liberation of Europe, an official specification (Rotaplane 10/42) was issued for the development of a rotary-winged gliding version of the Jeep. The project, sometimes referred to as the Rotabuggy (a name derived from Rotaplane and Blitz Buggy) was intended to be a means of transporting Jeeps into action and work on a prototype was undertaken by the M.L. Aviation Company at White Waltham aerodrome near Maidenhead.

The particular Jeep, a Willys model MB 4 x 4, which was adapted, retained the normal seating, steering and driving controls but was fitted with additional instrumentation to be used in connection with the new gliding role. On the rear of the vehicle was fitted a large streamlined fairing which carried a tailplane with outrigger fins and a tail skid. An enclosed cabin with side doors was fitted on the front of the fairing and over the Jeep body, and on the standard front bumper a towing hook was provided.

The Jeep was lifted by a 46 ft 8 inch diameter freely rotating two-bladed rotor with rotation being maintained in flight by the airstream. As the towing cable was released from the Jeep the rotor lowered the vehicle to the ground by auto-rotation as the airspeed decreased.

After the prototype was completed successful preliminary trials were carried out by towing the Jeep behind a car and subsequently flying tests were made behind a Whitley tug. Only the prototype, as illustrated by the drawings, was constructed, further work on the project being cancelled when the development of vehicle-carrying gliders, the Horsa and Hamilcar, made the Flying Jeep work unnecessary. Towards the end of the trials of the prototype new fins of a different shape and of a larger area to those shown on the drawings were fitted.

It was intended that on the Flying Jeep landing in the DZ (dropping zone) the tail fairing with the enclosed cabin and rotor would be detached from the Jeep and the vehicle would then be used in its normal configuration.

Only a limited amount of information has ever been released in relation to this interesting project but the drawing which illustrates this modelling article and which has been prepared as a result of a study of this limited data, is believed to be the most accurate and detailed drawing to have been published of the Flying Jeep.

Basic notes follow for stage by stage modelling using the Jeep from the Airfix 1:76 scale Buffalo and Jeep kit as the basis of the model.

**STAGE 1** Assemble the Jeep from the components in the kit carefully, following the instructions provided with the kit but omit the windscreen and folded hood and also the spare wheel and jerrycan on the rear of the vehicle. Carefully cut off the rear bumper plates.

**STAGE 2** From plastic card cut the four pieces required to make up the fairing and cabin measuring the size of these from the drawings and ensuring that when cut the edges of these four pieces are of the correct curvature. Sketch A should be referred to when working on this stage of modelling. Cut the small pieces of plastic card to represent the solid lower door panels and cement into place on the Jeep model after checking that the fit of these is correct.

Use transparent polystyrene sheet for the cabin windscreen and transparent door panel, cutting these to the measured sizes and bend as shown on Sketch A. The above components can now be assembled and cemented on to the Jeep but first check the fit of all joints. Don't forget to be especially careful when cementing the transparent polystyrene components as it is so easy to spoil this material with excess cement.

When all the joints have set, sand where necessary to obtain an overall smooth finish and fill any partially open joints or other defects with body putty.

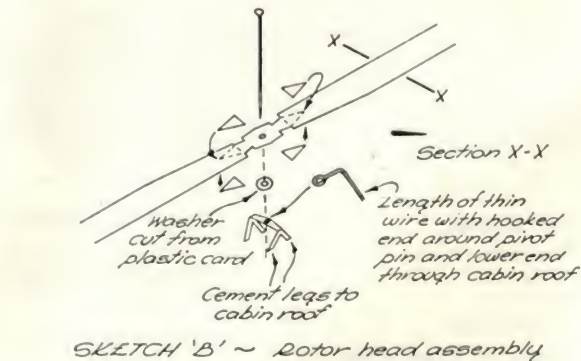
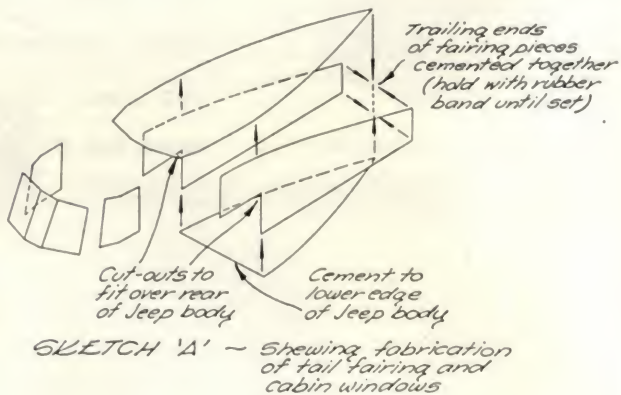


The author's neat model of the Rotabuggy Flying Jeep, based on the Airfix 1:76 scale model, which makes an attractive model for both aviation and military enthusiasts.

**STAGE 3** For the tailplane cut a piece of stout plastic card or pieces of thin card laminated to the thickness required. File and sand the tailplane to an aerofoil section and then cut a slot in each side of the tail fairing for the tailplane to pass through carefully scaling the location and slope of these slots from the side view drawing. Cement the tailplane in place through these slots making sure that the leading edge of the tailplane is at 90° to the centre line of the fairing before the cement sets and that the tailplane is level when the Jeep is sitting on the wheels.

Again from stout or laminated card cut the two shapes for the fins and then sand these to an aerofoil section. Check the fit of the fins on the ends of the tailplane and adjust as necessary before cementing into place. Allow all joints to set and then fill and sand any defects as it will be difficult to attend to this operation later without damaging the model.

Cut a length of wire or pin, bend to the shape of the tail skid and then push through a hole made in the underside of the tail fairing applying a dab of cement to hold the skid in place. From stretched sprue form the cranked tube on the offside front wing and cement in position on the model.

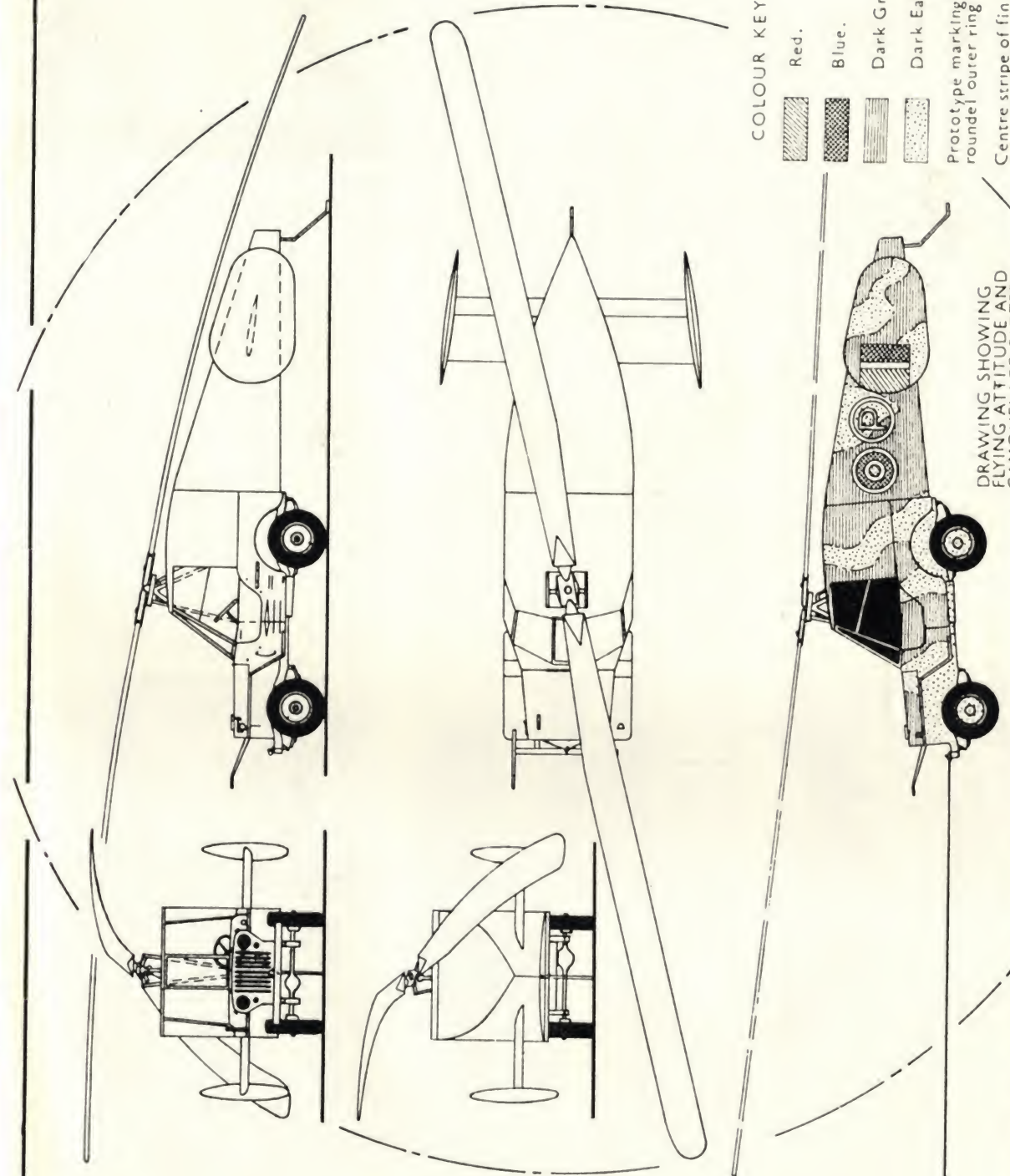


**STAGE 4** The construction of the rotors should now be proceeded with and as it would be preferable if the model was completed to represent the prototype in the ground 'sitting' attitude notes for modelling it like this follow. During the study of these notes reference should be made to Sketch B.

Perhaps it should be mentioned here that to simplify the modelling of

Continued on page 133

AIRFIX magazine



COLOR KEY

Red.

Blue.

Dark Green.

Dark Earth.

Prototype marking and roundel outer ring — Yellow

Centre stripe of fin marking & roundel inner ring — White

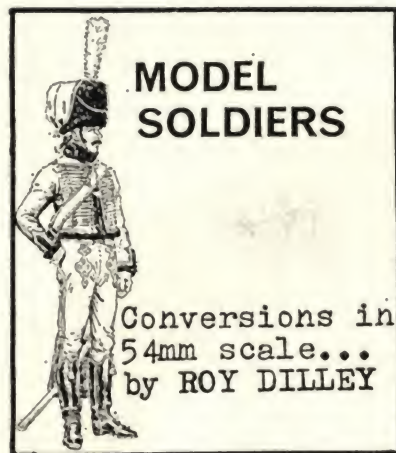
SCALE 1:76 (4 mm to 1 foot)

Drawn by Geoffrey W. Futter

DRAWING SHOWING  
FLYING ATTITUDE AND  
CAMOUFLAGE PATTERN

ROTABUGGY FLYING JEEP





LAST month, in the part of my article relating to the tools and materials required for the modelling season, I listed several manufacturers who supply accessories, or operate a spare parts service, in addition to their lines of complete figures. From one or two comments that have been referred to me recently, I gather that some misapprehension may exist in the minds of several readers regarding my exact meaning when I mention the use of such a manufacturer's products.

Let me make it plain, therefore, that, apart from the contents of my spares box, it is from the accessory or spare parts lists that I draw the useful items that are recommended in conversion details as being valuable time and trouble savers. For instance, when making the Military Policeman figure several months ago, I listed under parts required, 'I pair of Historex Infantry Officer's booted legs'. These were obtained from Historex Agents' spare parts service, and it was not necessary to buy a complete kit of the Infantry Officer in order to obtain the legs. Similarly, the Rose Models' oddments and H.R. Product's accessories are purchased as separate items, and not as parts of a kit of pieces to make a specific model. As I explained last month, these manufacturers issue catalogues and price lists, and reference to these will quickly establish just what is available in the way of spare items. Let me also make the point that the complete kits supplied by all these firms make up into truly superb models, and in many cases contain additional detailing items permitting a certain amount of variation to the basic figure. Over a period of time the enthusiast's spares-box will accumulate many such extra parts, which may be drawn upon at will. The position is now, I hope, quite clear.

I have recently been fortunate in obtaining, by virtue of the generosity of the manufacturers, and in advance of the actual date of issue, a set of the new Almarks kit of 'Panzer Grenadiers' to 54 mm scale. This consists of eleven

models of German infantrymen in various positions, complete with a separate sprue of arms and weapons, another of helmets and caps, and the requisite number of bases, enabling the figures to be made up in a variety of ways. Almarks' deservedly high reputation, based on their range of publications and transfers, will, I am sure, be further enhanced by this extension of their products. All the figures are well designed and minutely detailed, with accurate representation of uniforms and equipment. What is more, they are moulded in rigid polystyrene, which permits conversion work to be carried out with much greater facility than the flexible plastics. With my mouth watering freely, I examined this set with a view to its conversion potential, and the possibilities seem enormous. To start with, I decided to utilise three of these models to make a machine-gun team advancing, the figures chosen being the marching, standing firing, and charging riflemen.

As in the British Army of the same period, the fire power of the German World War 2 infantry platoon was based on light machine guns (LMGs), supplemented by rifles and sub-machine guns, but with the LMGs having priority of ammunition supply. At the beginning of the war, each platoon had five LMGs on its establishment, one in each of four sections and one in the platoon headquarters. Later on, when the infantry organisation was modified, platoons had four LMGs, one per section and one at HQ. The weapons involved were the MG 34, and the later MG 42, both known to British troops as the 'Spandau', and both having a very high cyclic rate of fire, producing in action a characteristic 'ripping' sound which once heard was never forgotten.

So efficient were these machine-guns, both from the points of view of operation and volume of fire, that a developed version of the MG 42 is in service with the West German forces to this day. One's memories of still and movie photographs of the war years seem frequently to include a scene of a German LMG section trudging along, so it seemed appropriate to make this the subject of my first Almarks' conversion. I have also incorporated certain accessories from the H.R. Products range but have given drawings of these items so that they can be made up from scrap plastic if necessary.

### Conversion 1

This is for the NCO team commander with MP 38/40 sub-machine gun. Almarks figure required is the marching rifleman.

Commence by cleaning off all flash from the moulding, and then carefully remove the entrenching tool from the right hip, putting it to one side for subsequent re-attachment. A fine fretsaw or similar tool is ideal for carrying out this operation, but if too much damage is done to the entrenching tool, it can be



Above: Close views of the machine gunner and the NCO from the rear show the moulded detail and the simple adaptations from the standard kit figures.

replaced by one made from scrap plastic and card to the same dimensions as the original (Fig 1).

Now turn the head to one side by cutting at the neck and re-cementing, using polystyrene cement. When this has set, trim off the cartridge pouches, and flatten an area immediately above and below the belt on each side of the buckle, ready to receive the sub-machine gun magazine pouches (Fig 2). Following this move the haversack further round to the back of the figure. This is accomplished by cutting the haversack in half vertically, removing the front half, and filling in the space between the rear half and the water-bottle with plastic filler. When dry, this is sanded down and becomes part of the haversack (Fig 3). At this time also remove the small length of bayonet scabbard from the left thigh. Now fix the figure to a suitable base; I discarded those supplied in the kit as being too thick and clumsy, and replaced them with ones constructed from two thicknesses of plastic and metal as described in previous articles.

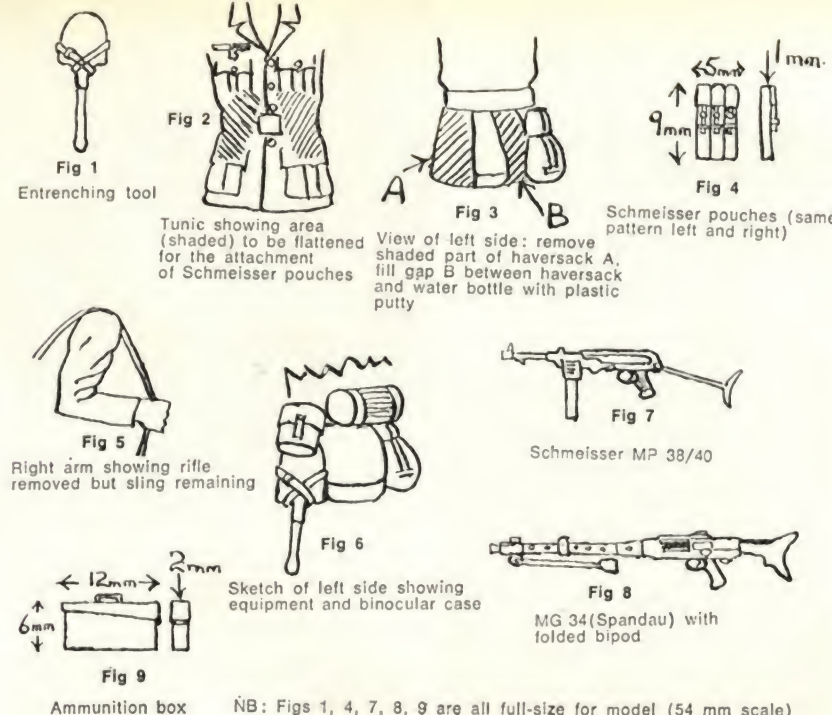
The sub-machine gun pouches are now fitted on each side of the belt, using Araldite if H.R. metal pouches are used, and polystyrene for scratch built plastic items (Fig 4).

Then, having removed the slung rifle from the figure's right arm, being careful to leave the sling, cement both arms in place (Fig 5). Now re-fix the entrenching tool, this time to the left hip in front of the haversack, and cement a binocular case to its top edge (Fig 6). Next, Araldite or cement binoculars to the chest, and an MP 38/40 sub-machine gun under the right arm (Fig 7). Finally, having carefully trimmed the rim and inside of the helmet to fit closely to the head, cement it in place. When everything has thoroughly set, undercoat and paint the figure.

### Conversion 2

This is for the machine-gunner carrying the actual MG 34. Figure required is the standing rifleman less arms.

This is a much simpler conversion than the previous one, but it looks remarkably effective. Again clean off all flash from



the figure and mount it on a suitable base. A pair of arms are now selected from the kit's arm sprue to give a bent right arm and a straight left one. These are cemented to the figure. Now, using the dimensions in the diagrams, construct an MG 34 machine gun, and fix it in place over the right shoulder, with the pistol grip held by the right hand (Fig 8). The photograph will illustrate exactly

how this should appear. Next, trim another helmet and fit to the head, after which the figure is ready for painting.

Below: Front and rear views of the complete MG 34 machine gun team, the three different conversions described here. All use basic Almarks figures with the actual body positions unaltered.



T. Hameeteman of Leiderdorp, Holland, made this realistic wargames set-up utilising the 'Sherwood Castle' kit made by Airfix. It was built on a base of styrene ceiling tiles to form a moat. Faller embossed stonework sheet forms the courtyard paving.

### Conversion 3

This makes the ammunition carrier with two ammo-boxes. The Almarks figure required is the charging rifleman.

Remove all flash from the figure and carefully detach the gas mask canister from the back, re-cementing it lower down just above the belt. The complete rifle should now be trimmed from the right arm, and after the butt has been carefully shaped to get rid of the clutching fingers, fix it to the back of the figure above the gas-mask canister, with the barrel slanted up over the left shoulder (see photo). Next, make two ammunition boxes from scrap, and cement them to the hands of left and right arms taken from the sprue. These arms are then fitted, and a rifle sling made from a 1 mm wide strip of 10 thou plastic card is fixed from the rifle butt, around the figure and over the left shoulder back to the rifle stock. Repeat the trimming process with another helmet, and when it has been fixed in place, all is ready for painting.

Colours of uniforms and equipment are given in the kit instruction sheet and box art, but the Almarks' book, *German Combat Uniforms*, can also be consulted for these and alternatives, such as Waffen-SS uniforms.

Even newcomers to the hobby should be capable of obtaining excellent results with this set of figures, and I am sure that other conversions and adaptations will readily come to mind. Let me stress that at the time of writing these Almarks kits are not yet on sale, but they should be in model shops a week or two after this magazine is published.



# Old time saddle tank

An attractive conversion suitable for motorisation based on a Swansea & Mumbles type . . . by Michael Andress

I DECIDED recently that it was time I built a real old-timer for my railway and the result is the little engine illustrated here. It is based on a sketch in *The Light Railway Handbook*, by R. W. Kidner, of one of the Swansea and Mumbles Railway locomotives. The prototype was built in 1877 and used on the line until 1892, when it was sold. My model is not an exact copy as I wanted to use the Airfix Pug as a basis but I have tried to retain as much as possible of the character of the original. Even if your railway is too up to date for such an engine, you could still build it and leave it abandoned and disused on an overgrown siding or, even better, place it on the platform of your main station as a preserved locomotive for your miniature railway enthusiasts to admire!

Begin construction with the footplate (Part 7). Cut off the toolboxes using a razor saw. Now cement pieces of thin plastic card under the openings this leaves in the footplate and also under the rectangular opening between the toolboxes. Fill these openings with body putty and also fill the two holes for the reversing rod (Part 19) and the hole for the handbrake (Part 16). At the rear of the footplate there is a cut away rectangular area at each side (intended to take the steps of the cab sides). Use pieces of 60 thou thick plastic card to fill in these areas. Cut 3 mm from the front edge of the footplate using the razor saw and taking care to keep the cut square and true. Glue together the left hand and right hand mainframes (Parts 1 and 1A) after cutting 3 mm from the front end of each. Fit the axles and wheels (Parts 2 and 2A).

At the front end of each mainframe there is a protruding part on to which the cylinders will be fixed; these must be cut down with the razor saw from 8 mm to 4½ mm to allow the cylinders to fit further in beneath the footplate. Each cylinder (Parts 4 and 4A) has two bars attached to its rear surface; these are cut off flush with the rear surfaces of the cylinders proper. The cylinders can now be attached to the mainframes and the mainframes fixed to the under-surface of the footplate (Part 7). As all the driving gear on this engine is hidden by the covers, I took a short cut and left all these parts out of my model.

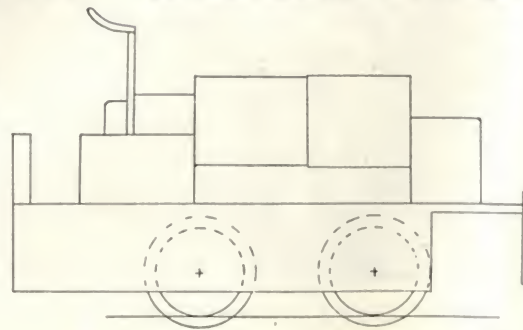
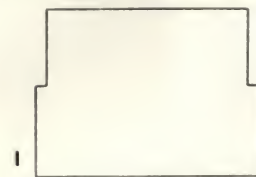
Cut the two halves of the chimney away from the two boiler halves (Parts 8 and 8A), taking care not to damage them (this part of the boiler doesn't matter as it will not be used). Then fix the two boiler halves (Parts 8 and 8A) together

and when the cement has dried, firmly cut off the front section (the front 14 mm) with the razor saw, but taking care to leave the front springs intact (their front ends will be left protruding in front of the cut). Cut off the large dome and fill the hole left with body putty. Then, with a fine file and sandpaper, smooth the surface so that no trace of the dome remains. At this stage cut off the handrails. This is most easily done with a sharp modelling knife, being careful not to damage the rest of the surface of the boiler. Finish with file and sandpaper to leave a smooth surface. Cut pieces of 20 thou thick plastic card to cover in the front and rear ends of the boiler. Make these parts slightly oversize, cement in place, and then trim down to the exact size. Fix the boiler to the footplate so that its front surface (not counting the front ends of the front springs) is 5 mm behind the front edge of the footplate.

The cab front (Part 12) is modified next. Cut carefully around the firebox where it joins the cab front proper to separate the two. Cut the top of the cab front so that it is straight instead of curved, and then rejoin cab front and firebox so that only 2½ mm of the firebox extends behind the rear surface of the cab front. Cut a strip of 10 thou thick plastic card 8½ mm wide and about 40 mm long. Cement the cab front to the footplate so that the distance between the rear of the boiler and the front surface of the cab front is 8½ mm. Fit the strip of plastic card into this gap and trim it to the exact length needed; it can then be cemented into place supported by the part of the firebox which extends in front of the cab front.

I had a spare cab front (Part 12) left over from an earlier conversion and I cut the firebox off to use as a smokebox for this engine, but alternatively you could build one up from plastic card. If

**Below:** Bunker back and deep buffer beam — actual size.  
**Right:** Side view to full-size. Model could be motorised with small mechanism or motor bogie as the wheels are largely hidden.



*Diminutive tank loco conversion raises 'steam' on the engine depot of Michael Andress's layout. Side skirts mean that motion can be omitted.*

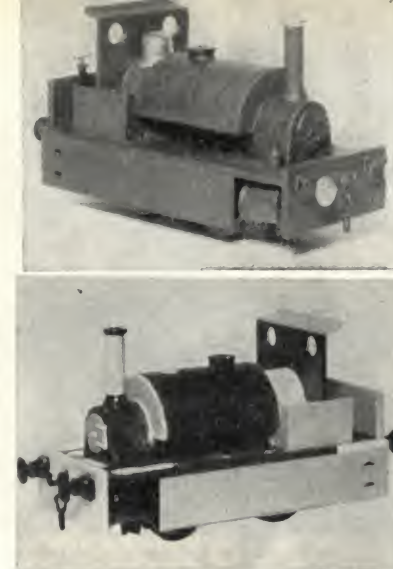
you are following my method, first of all cut and file off the firebox door and the gauges from the rear surface and then cut vertically down immediately behind the rear face of the cab front to separate the firebox. Then cut the bottom part of the firebox away to leave a height of 11½ mm. The rear face of the firebox will form the front face of the smokebox. Cut away a small square at the bottom of what is now the rear edge on either side to clear the front ends of the front springs, then cement the smokebox to the footplate and to the front surface of the boiler. The smokebox door is an 8 mm diameter disc of 20 thou plastic card. Hinges and handles are cut from small pieces of scrap plastic. Cement the two halves of the chimney together and when firmly stuck, cut off the base and top, discarding the part between. A new centre piece 12 mm in length and 4 mm in diameter is needed. I had no tubing or rod of this size so I used a length of Biro refill and rolled paper around it until it was the required diameter, fixing the paper with cement. When this had dried I sanded the surface so that the join where the paper ended was not visible. After cementing the top and base to the two ends of the centre piece, the chimney is fixed to the top of the smokebox.

The front buffer beam is a rectangle

of 60 thou thick plastic card, 30 mm by 12½ mm, cemented to the front of the footplate and the front ends of the mainframes with 1½ mm extending above the footplate. The cab back and the rear buffer beam are made in one piece from 20 thou thick plastic card to the full size pattern shown in Fig 1. The bunker sides are 16 mm by 10 mm rectangles of 20 thou thick plastic card fitted to the footplate so that their front edges are level with the rear surface of the boiler. Cut pieces of 20 thou thick plastic to fit between these and the firebox to form the fronts of the bunkers. A piece 2 mm by 10 mm of the same material is cemented to the front of the cab back at each side to form the rear part of each cab side. The side covers which close in the wheels and motion are cut from 20 thou thick plastic card to the pattern shown in Fig 2. The step openings are best made by making a central hole with a fine drill or with a round needle file and then filing out to the exact shape required. These covers are then cemented to the undersurface of the footplate and to the front of the rear buffer beam.

If you look closely at the kit buffer beams you will see that at the base of each buffer there is a square about 4 mm by 4 mm. Cut through the buffer beams, using the razor saw, around each of these squares. Then cut down the length of each rounded shank to 2 mm. The thinner part of the shanks of the buffer heads (Parts 18) must be cut quite short, about 1 mm, to fit into the shortened sockets. The buffer heads may show small central pits; if so, these should be filled with body putty before painting.

As my model is non-working I used the scale coupling hooks which I improved by filing out the centres of the links with a needle file. After cutting down the locating lugs of the couplings by removing about 1 mm, I cemented



**Above:** Side skirts drawn full-size; two required. **Top:** Two views of finished model. **Left:** Model before painting.

of the firebox; I used an undercoat of yellow followed by a coat of gold to represent brass. The bunkers can be filled with body putty topped off with imitation coal glued in place. Final touches are the addition of the handbrake (Part 16) (with the locating lug removed and the handbrake resituated so as not to block the cab opening) and the regulator handle (Part 11).

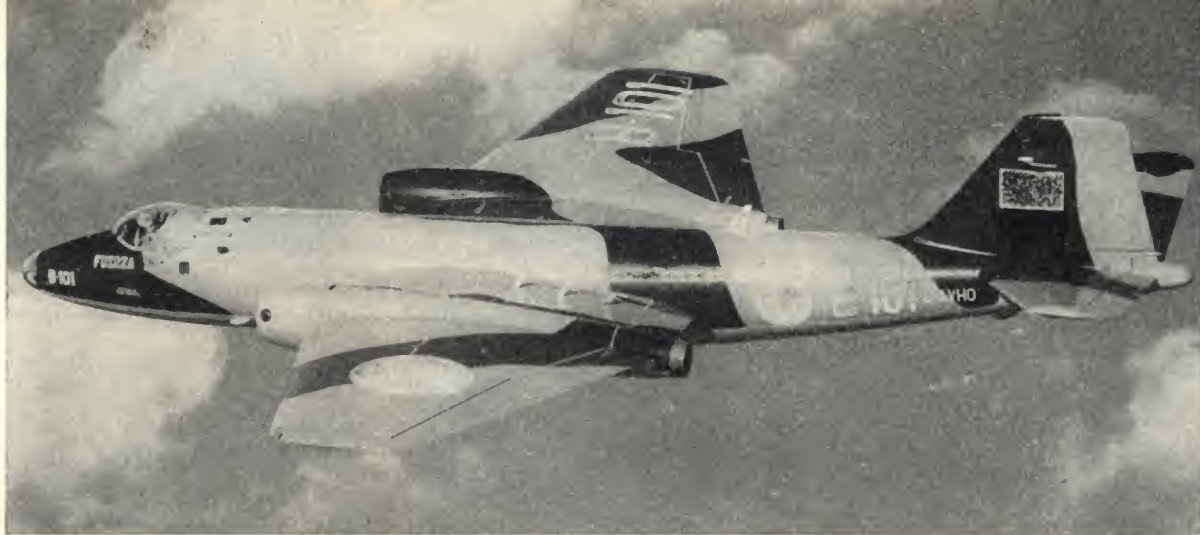
It is best to paint some of the parts before or during assembly but I have left the painting until later so that I could photograph the model to show clearly the added parts of plastic card. The other pictures show the completed locomotive. The bucket is from Bec Models and the driver is an Airfix figure. This simple conversion is a real 'quickie' and it lends itself to motorisation using a motor bogie or other chassis of suitably small dimensions. The wheels and frames from the kit are omitted, of course, in this case and a suitable slot must be cut in the footplate. As the wheels and motion are hidden, you can use virtually any power chassis which fits. Motorisation would be even easier in narrow gauge, using a Minitrains or Playcraft chassis.

## Models from readers



**Above:** Jyun Oozumi of Tokyo, Japan, made this Boeing 737-200 of All Nippon Airways with markings hand-painted. Wings are painted in the light grey, dark grey, and natural finish panels applicable to all 737s. **Left:** An easy and interesting conversion from J. V. G. Francke, London NW8, is the Supermarine Seafang, planned successor to the Seafire, and navalised version of the Spitfire 22 to which is assembled the wings and undercarriage of the Frog Supermarine Attacker. Contrarotating propeller can come from the Frog Shackleton or be fashioned using one as a pattern. Add air scoop under nose and radiators under wings. For a Spitfire the Hawk kit propeller can be used.





Still going strong . . . on show at Farnborough was this Canberra B62 for the Argentine Air Force. Completely rebuilt from a B2, this aircraft had the civil registration of G-AYHO in addition to its military serial.



**B**ITTEN-NORMAN, the manufacturers of the very successful Islander mini-airliner, sprung a surprise on the crowds at the Farnborough Air Show. They produced the Mk 3 version of the aircraft which has three engines—the third as part of the tail unit!

The Islander Mk 3 is purely experimental. At the moment there is no question of producing the aircraft for commercial use but the possibility of providing Islander operators with a version having increased power and extra seating will be considered during the evaluation tests and in face of customer reaction.

Arriving on the first public day of the show, Friday, September 11, the Tri-Islander made its first flight that same morning. By working many hours of overtime the engineers at Bembridge had the new aircraft ready for flight by the early hours of Friday morning and with both John Britten and Desmond Norman at the controls, together with a flight test observer, it was airborne at 0645. The first flight lasted an hour during which most of the handling characteristics were explored. These included feathering and unfeathering the third engine. At a press conference after their arrival at Farnborough, Desmond Norman said that the Islander had extra power in the third Lycoming engine and the climb was just as satisfactory as on the standard aircraft.

After refuelling, the aircraft went up for a second flight, followed by the Air Registration Board evaluation trip which qualified it to appear at Farnborough. G-ATWU, the registration of the Islander Mk 3, is the second of the original prototypes. It was built in 1966, was modified two years ago with a 2 ft fuselage extension and has now acquired the third fin-mounted engine and a further extension of 90 inches in fuselage length so that 17 seats can be provided.

The components for the new fin were built by Miles Aircraft. The tailplane is of the variable incidence type operated by an

electric motor. All of the work on the prototype was done in less than two months using standard production components. This is obviously a great selling point for the manufacturers. Although they emphasise that the Mk 3 is purely experimental, there can be no doubt that should commercial interest be great enough a production aircraft could be flying by the end of 1971. Two companies have already expressed an interest in the type. The predicted price of the Islander Mk 3 fully equipped and duty free would be around £85,000.

#### First F-111s in Europe

The long-awaited General Dynamics F-111 arrived in England at RAF Upper Heyford on Saturday, September 12. The first two aircraft, serialised 80035 and 80045, landed at the Oxfordshire base after a 3,300 mile trans-Atlantic flight which took 6 hours 43 minutes. They had come from Langley AFB, Virginia, where they night stopped because of bad weather. The original plan had been to fly direct from Nellis AFB with two in-flight refuellings.

The two aircraft are the advanced guard of 72 F-111s which will equip the 20th Tactical Fighter Wing at Upper Heyford by July 1971.

**Below:** The first of two F-111s to arrive in the UK. This aircraft, serialised 80045, reached Upper Heyford on September 12 and was the first of 72 which will equip the 20th TFW by mid-1971 (Photo Peter March). **Bottom:** A photograph of the model mock-up of the new Islander Mk 3. This aircraft with its third engine incorporated in the fin flew for the first time on September 11 and caused a minor stir amongst visitors to the SBAC show at Farnborough.



AIRFIX magazine



Airborne for the first time from Long Beach Municipal Airport, California, the McDonnell Douglas DC-10 Series 10 prototype spent three hours twenty-six minutes in the air before landing at Edwards Air Force Base from where the initial flight trials will be conducted.

#### First Flight of DC-10

The first of the wide-bodied tri-jets—the DC-10—flew for the first time from Long Beach Municipal Airport, California, on August 29. After a test flight of 3 hours 26 minutes, it landed at Edwards Air Force Base in California's Mojave Desert from where the preliminary flight trials will continue.

During the first airborne test the gleaming white DC-10, with its McDonnell-Douglas markings in red and blue, reached the programmed speed of 345 mph but exceeded the planned altitude to reach 30,000 ft.

In the cockpit, the DC-10 project pilot, Clifford L. Stout, who acted as captain for the first flight, was joined by Harris C. van Valkenburg, deputy chief engineering pilot, as first officer, John D. Chamberlain, flight engineer/second officer, and Shojun Yukawa, flight test engineer.

No engine smoke, so characteristic of many American jets, was visible as the DC-10 left the runway. Its three powerful General Electric fanjet engines, each generating 40,000 lb of thrust, got the aircraft airborne in a distance of 4,980 ft. Observers near the runway and others witnessing the take-off noted that sound levels from the high by-pass ratio engines were markedly lower than those of other four-engined airliners operating from the same airport.

At take-off the DC-10 weighed approximately 340,000 lb, some 70,000 lb less than the 410,000 lb designed gross weight of the initial Series 10 models. In addition to the four men and ballast on board, the transport carried 100,000 lb of fuel and 25,000 lb of test, recording and telemetering equipment.

The objects of the first test flight were to evaluate the handling characteristics, airborne tests of various aircraft systems and a functional check-out of the test instrumentation and data transmission systems. The DC-10 was flown just 37 days after it had been rolled out on July 23.

When it enters airline service it will carry from 255 to 345 passengers at speeds of over 600 mph. Three models are in production at the Long Beach factory: the Series 10 for medium and transcontinental United States flights and the Series 20 and 30 for intercontinental routes.

The maiden flight climaxed 28 months of design, development and manufacture which followed the April 1968 announcement that the McDonnell Douglas company would produce the new aircraft. The flight also marked the start of a year-long flight development and certification programme.

The first DC-10 will remain at Edwards Air Force Base for initial test flights. Subsequent operations will be centred at the McDonnell Douglas facility at Long Beach where the tenth DC-10 airframe has started construction. A new flight test facility is also being set up at Yuma, Arizona.

Five aircraft will be used in the flight development programme, each allocated to a complete portion of the tests required for certification by the Federal Aviation Administration. Ten flight crews will be used, headed by the Douglas chief pilot, A. G. (Heimie) Heimerdinger.

Missiles and long-range tanks were the feature of the French-built prototype of the Jaguar seen at Farnborough. Here the aircraft is taxiing out for its demonstration flight.

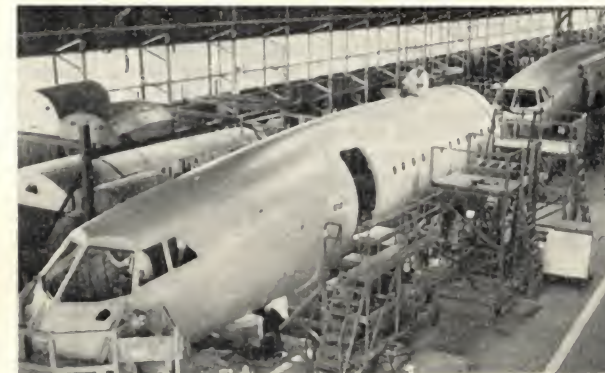


#### British Aircraft Preservation Council Expands

With the Lincolnshire Aviation Enthusiasts being recruited to the impressive list of member societies in the British Aircraft Preservation Council, there are now 14 groups or museums associated with the cause.

Names such as the RAF Museum, Fleet Air Arm Museum, Army Air Corps Museum, Imperial War Museum, Shuttleworth Trust, Skyfame and individual societies at Newark and Lincoln, plus the Northern, Midland, South Wales and Southern groups, are associated with the organisation and much hard work is being put into locating and finding storage for ancient and time-honoured aeroplanes.

Recent discoveries have included a Morane Saulnier BB fuselage of 1916 vintage which has gone to the RAF Museum, and a BAPC39 Zephyr sailplane built in 1933 by the late E. W. T. Addyman in Harrogate, which has been obtained by the Northern APS for storage in Leeds.



**Top:** Concorde production progress. Nose and forward fuselage sections now in series production at the Weybridge factory of BAC. The rear fuselage and fin of Concorde will also be made here and all these components are now in manufacture for the first six series production aircraft. **Above:** The Scottish Aviation Bulldog. Now in production for the Swedish Air Force and currently seeking new orders, the manufacturers hope to save something from the demise of the Beagle company. **Right:** Harrier T2 detail. This picture taken at Farnborough shows the B type roundels now being applied to the upper wing surfaces and fuselage sides of production aircraft. Although subject to confirmation it appears that all Harriers will eventually be marked in this way.





# 'Leander' class frigates

NOTES FOR THE NEW AIRFIX MODEL  
BY PETER HODGES

WHEN the building programme of the 'Daring' class was completed, it marked the end of an era, for these were the last warships of the conventional destroyer type to be built for the Royal Navy.

The ships which were to form what was heralded as 'Britain's New Navy' began to emerge in 1955, when the faithful 'maid-of-all-work' of the service, the destroyer, was replaced by a new-style frigate. The latter classification had itself been re-introduced during the second world war, and described an escort ship lying between the small corvette and the normal destroyer. The first to be so designated was the 'River' class, followed by the 'Lochs' and 'Bays'; but after the war, all the existing corvettes and the 'Hunt' class escort destroyers—as well as the sloops—were reclassified as 'frigates', so that the original size-discrimination was lost.

The post-war frigate, however, was to be a much more powerful vessel, comparable to the Fleet Destroyer in speed and displacement but very differently armed, the most significant change being the total absence of conventional torpedo tubes.

Three distinct types were designed for anti-aircraft, anti-submarine and aircraft direction duties and they were allocated a type number accordingly. All A/S ships were in the 10 series; A/A ships were in the 40s; and the A/Ds in the 60s. Thus, the new A/S Frigates became Type 12 (joining existing ships of the Type 14, 15, and 16 groups) and the others Type 41 and 61, respectively.

All three types of new construction vessels had a basically similar hull, identified by a weatherly bow, a high fo'c'sle and a sloping deck leading to a gun-deck forward of the bridge; but while the A/S ships were given twin-shaft steam turbines, both the A/A and the A/D groups had diesel propulsion.

Forward, all three had a similar fire control system with its associated Director controlling a totally enclosed twin 4.5 inch DP gun mounting of the same basic type as that carried in the 'Daring' class. The remaining armament depended on the special function of the ship: the Type 12s had two 'staggered' 3-barrelled A/S mortars; the Type 41s, a second twin 4.5 inch in 'X' position; and the Type 61s, extra early warning radars. All supplemented these with a fully automatic STAAG twin Bofors—either amidships (in the case of the Type 41s) or in 'X' position (in the case of the others). In addition, the non-A/S types had a single 'Squid' mortar to give them some anti-submarine capabilities.

The 'Whitby' class Type 12s were by far the most successful and were extended on to a second run of ships—the 'Rothesay' class—which ended when *Lowestoft* was launched in June 1960. The Type 12s found favour in the Commonwealth, too. Australia built four in her own yards; South Africa ordered three; and India and New Zealand, two each. India also ordered three of the A/A ships and named them *Beas*, *Betwa* and *Brahmaputra* after three of her rivers.

During the overall building programme it became clear that the re-equipment of the Fleet with ships designed for specific duties would prove very costly and a decision was made to produce a General Purpose Frigate which could fulfil all the functions of the 12, 41 and 61 Types.

This resulted in the 'Tribal' class, or Type 81 Frigate—to give them their GP group designation.

These vessels—seven were launched between 1959 and 1962—were totally different from the earlier types in almost every



Top: HMS Leander, name ship of the class shown with two single Bofors guns on Bofors gun deck aft. Above: Top view of Ajax showing well for A/S mortar and ramp for VDS (Pictures from 'Navy News' postcard series).

respect. Their conventional hulls were reminiscent of the American destroyer in having no 'break-of-the-fo'c'sle'; they mounted two single 4.5 inch guns in 'A' and 'Y' positions controlled by a different fire control system; they had only one triple-barrel A/S mortar; and were propelled by a combined steam and gas turbine installation on one shaft. Additional flexibility was gained by providing a helicopter, housed in a hangar sandwiched between 'Y' gun and the A/S mortar. The aircraft lift formed the flight deck in the upper position.

The Type 81 Frigates had certain limitations in design, notably in the open aspect of the gun mountings and in the rather cramped Hangar/Flight Deck arrangements, but the 'General Purpose' concept promised better value for money. The principle was extended to a new class known as the 'Leanders', all named after classical characters of mythology whose names had been adopted by the old sailing frigates and also by several classes of pre-war light cruisers. The tidy minded will no doubt spot a bogey in *Cleopatra* who, from all accounts, was far from imaginary!

The new 'Leanders' reverted to the basic 'Whitby' style hull—in fact *Ajax*, *Dido*, and *Leander* herself were laid down as 'Rothesay' class ships; and *Penelope* was to have been the fifth A/D. Like the Type 12 they have a twin 4.5 inch in 'A' position but then combine all the special attributes of the earlier 'specialised' frigates.

Thus they have, in the 'fully-fitted' state:

- (a) A 'bedstead' early warning radar on the mainmast.
- (b) A triple-barrel A/S mortar.
- (c) A Wasp helicopter; and in addition:
- (d) A Seacat guided weapon system aft.
- (e) A variable depth sonar.
- (f) The most modern radio and radar equipment.
- (g) The latest gunnery fire control.
- (h) Power operated hydraulic boat davits.
- (i) Extensive internal air conditioning.

These eminently seaworthy vessels are acknowledged as the finest of their type in the world and have already been built for both the Dutch and the New Zealand navies. When the building programme is complete, there will be 26 in the Royal Navy supplemented by the 'Rothesay' class which are being converted as far as possible to the same equipment standards. This involves the suppression of their forward A/S mortar and the building of a 'Leander-style' flight deck and hangar.

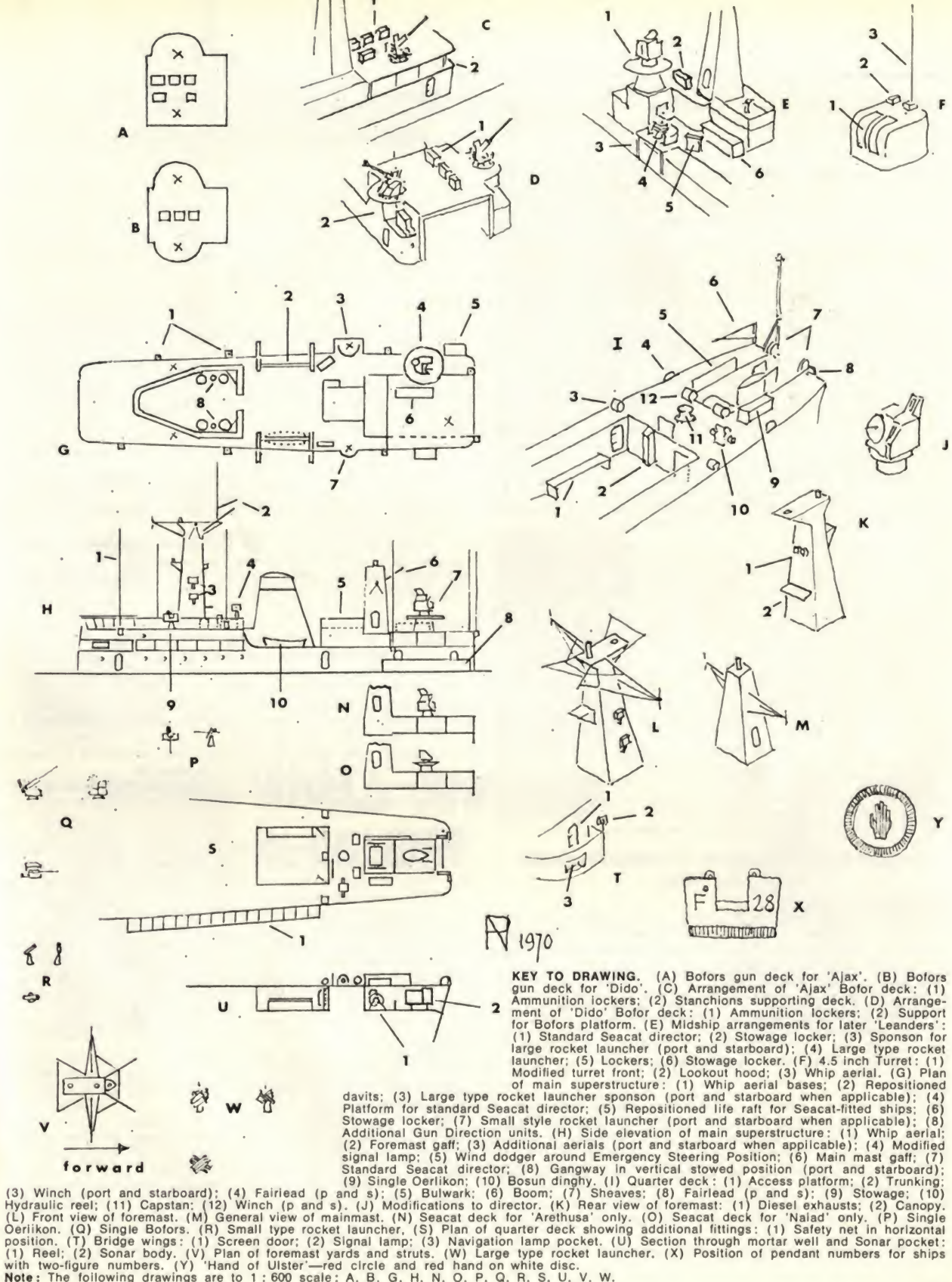
The lead ship—*Leander*—was launched from Messrs Harland and Wolff's yard in June 1961, and as one might imagine, there are a number of variants within a class whose building programme will extend over ten years. Examples of these appear in the appropriate table and all are easily adapted from the Airfix kit.

## Armament differences and extra fittings

The most noticeable difference between the variants centres on the close-range armament. The first seven ships were fitted 'for but not with' the Seacat system and mounted two single 40 mm Bofors instead. *Naiaid* followed but had an interim lightweight

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## 'Leander' class—continued

Seacat director, while the next in line—*Arethusa*—had the first installation of the standard radar-controlled director but low-set compared with the later ships.

At about this time, single 20 mm Oerlikons began to be fitted abreast the foremast in those ships fitted with Seacat, and these are now standard equipment. They are not fitted, however, on the early ships with 40 mm Bofors. Most of the class have also had a multi-barrel rocket launcher added on a new sponson abreast the main mast.

The 'Leanders' were designed to carry the overstern Variable Depth Sonar (VDS) but again some ships are fitted 'for but not with'. In its stowed position, the towed body rests in a cradle in a recessed pocket of the stern and is launched by a pantograph gantry which ensures that the body remains parallel to the horizontal plane as it is extended. All this equipment is poorly modelled in the kit but details are shown in the drawings.

Most ships now carry a small inflatable assault craft and those without VDS often stow it in the Sonar pocket. The others carry it on the Seacat launcher deck.

There are a large number of whip aerials positioned around the upper deck and the later units of the class have additional electronic devices on the sides of the foremast. For recreational purposes, a 'Bosun' class sailing dinghy is carried and is stowed on the upper deck beneath the motor cutter on the port side. It is lowered by the cutter's davits when that boat is in the water, and has a brightly coloured hull which makes a nice spot of contrast in the model.

At main deck level, abreast the Seacat deck, there are gangways to port and starboard which stow flush with the guard rails when not in use and these can be modelled by simple strips of thin plastic. The flight deck area has safety nets combined with the guard rails along its edges which are lowered to the horizontal position when flying is in progress. 'Fishnet' nylon stocking is ideal material to model these.

Before dealing with the variants, there are a number of errors in the 'Leander' components and kit instructions which the particular modeller will wish to correct. Indeed, those who have already built her may well think it best to scrap their existing model and start again; a heartrending decision no doubt but vital if one wishes to avoid the caustic comment of those 'shell-backs' who have been fortunate enough to visit one of the class during, perhaps, Navy Days. The most glaring error—literally—is in the colour scheme and because it is always best to paint individual items before assembly, the critical modeller should make timely reference to the detailed list.

### Detailed Building Sequence (in conjunction with Variants Table)

#### Instructions—Section 1

- (1) Radius off the centre web of part 2 as shown in the scrap sketch and add a second square section boss on the gun-house roof. One is the look-out hood and the other a whip aerial base.
- (2) Cut out access doors into the mortar well and VDS pocket. A good effect is obtained if these are left 'open'.
- (3) Add a hatch-cover (3 mm side) immediately abaft turret on the centre line.
- (4) Cut off the upper part of the jackstaff (11). A separate wooden replacement should be added later.

#### Section 3

- (1) Cut an access between the two signal lamps (29 and 30) leading to the projecting platform in front of the funnel.
- (2) Cut access doors into part 22 and add portholes as shown.
- (3) Discard parts 27 and 28: they are incorrect as single Oerlikons and are poor replicas of single Bofors. Replace them with repositioned Oerlikons to the pattern and plug the holes.
- (4) The fire control director (26) is incorrect and has been moulded as a sort of mirror image of the prototype. Rebuild it as shown.
- (5) Cut tiny slots in parts 23 and 24 to represent the navigation lights.



Above: *HMS Naiad* with *Seacat* launcher aft (Picture from 'Navy News' postcard series—prints available at 1s 6d each from 'Navy News', RN Barracks, Portsmouth, Hants).

- (6) Modify the signal lamps (29 and 30) to the correct shape and mount them in the extreme corners of the gun direction position.

#### Section 4

- (1) Parts 36 and 37 are rather lumpy and are better replaced by extended plastic sprue. The additional struts can be added at the same time.
- (2) Add short stubs on the deck abaft the foremast to represent the gunnery direction instruments.
- (3) Add the extra electronic aerials on parts 31 and 32.

#### Section 5

- (1) Replace parts 46 and 47 with extended sprue and cut accesses into the sides of 43 and 44.
- (2) Cement part 45 facing in the opposite direction, or along the fore-and-aft line, if the model is to be 'at sea'.
- (3) Add the sponsons for the launchers as applicable and the additional lockers.
- (4) Modify part 42 to suit the appropriate armament and alter the director (49) in the same way as part 26.
- (5) Add a wind-dodger around the Emergency Conning Position (41).

#### Section 6

- (1) Reduce the number of life-rafts (56) by one on each side and mount them level with the bridge wings, as shown on the box lid. There should be six per side but the moulding is overscale and only five will fit.
- (2) Connect the boat davits by horizontal shafts, having repositioned them as shown. Add the 'Bosun' dinghy after it has been painted.
- (3) Cement small strips on the ship's side abreast 42 to represent the gangways in their stowed position.
- (4) Reposition the single life-raft (59) as applicable, making sure that the height of 58 and 59 conforms to 1 above.

#### Section 7

- (1) Thin down the Wasp main rotor blades and bend them carefully to give a slight downward droop.
- (2) Add the gangway in the mortar well on the starboard side (Note: the ceremonial stowed position of the mortar is with the barrels upright and angled forward); add a hatch cover (3 mm side) in the port forward corner of the mortar well.
- (3) Add the Sonar winches and after capstan in the area of the mortar well and the Sonar towed body beneath part 67.
- (4) Plug the hole for the ensign staff (69) and make up a tripod (similar to the jackstaff) located close to the Sonar well, as shown.

#### General

Make up whip aerials and position them as shown in the sketches. The flight deck markings should be symmetrical and the athwartship white line dead straight. The existing transfers can be modified with care.

The Wasp provided in the kit is a bit rudimentary but can be much improved by adding an undercarriage made from plastic sprue and a tiny tail rotor. (Painting details for the helicopter are included at the end of the painting scheme.)

Omit the hangar door if this is to be modelled in the 'open' position. The internal hangar deck should then be the same dark grey as the flight deck and the interior of the hangar, white.

To depict 'Flying Stations', leave a 3 mm gap at the foot of the 'roller shutter' type hangar door; arrange the safety nets in

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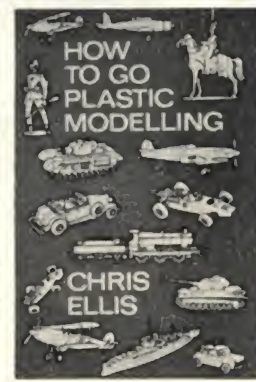


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BY **NORMAN SIMMONS**

I FINISHED up last month's article on the GWR 'Saint' Class conversion by briefly mentioning the problem of the tender since the 'Saints' were invariably fitted with 3,500 gallon tenders whereas the Triang-Hornby *Albert Hall* used in the conversion has, of course, a 4,000 gallon type. An obvious solution to the problem was mentioned in that it is perfectly possible to use one of the readily available Wills or K's cast metal kits. However, it is almost a point of honour to use as much of the basic raw material as possible when undertaking one of my conversions and since I had a perfectly good Triang-Hornby 'Hall' tender on my hands after the conversion, it could not be left to go to waste.

On close examination the Triang-Hornby *Albert Hall* tender appeared to have conversion possibilities and this was confirmed when the method of assembly was examined. By releasing the screw on the underside between the leading and centre axle it is possible to separate the underframe from the body, thus considerably aiding the task of conversion. A ballast weight is held inside the tender body by a piece of plastic foam and these fall out when the body is separated from the chassis.

**Below:** Two views of the 'Hall' tender before painting showing in white the plastic card additions and also the added handrails. Note the raised footplate.



A 3,500 gallon tender for the 'Hall' or 'Saint' models described in the last two issues is a fairly easy conversion from the existing Triang 'Hall' tender. Here the modified tender is compared to the original.

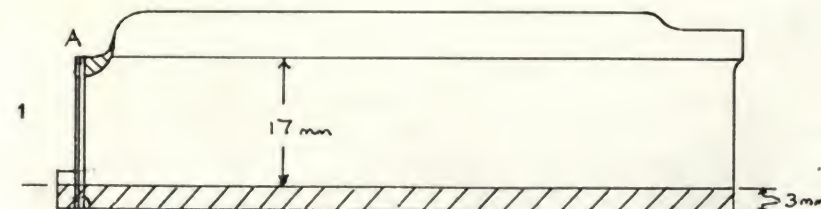
## GWR 3,500 gallon tender

A MODEL SUITABLE FOR 'HALL' OR 'SAINT' CLASS LOCOMOTIVES

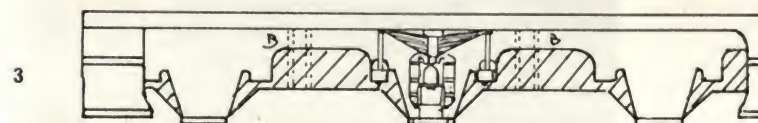
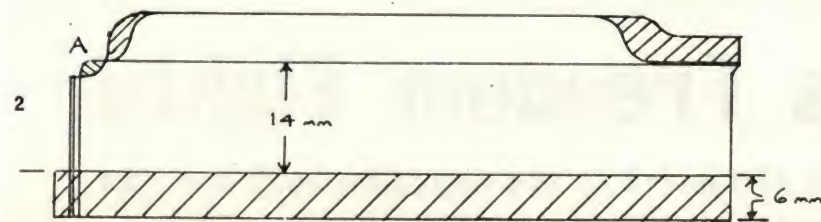
Needless to say, these parts must be kept safely to one side for re-assembly when the conversion is completed. The coupling hook also drops out but it is preferable to replace this part with a new hook which permits the tender to be coupled closer to the engine. A suitable alternative was fitted to the 'Hall' locomotive described in the September issue and consisted of a piece of plastic sprue, selected as to diameter to fit in the hole of the locomotive coupling, cemented immediately behind the front cross beam of the tender. A groove was filed in the back of the cross beam which not only enabled the vertical coupling pin to come further forward to give the right distance behind the locomotive, it also helped to maintain the pin in the correct position and give strength to the join. Additional pieces of plastic card were cemented around the plastic sprue pin to give yet further support. This detail can be seen in the illustration in the September issue, page 13. The rear Triang-Hornby interlock coupling can also be removed at this stage. Even if you wish to retain this feature it is better to remove it while carrying out the conversion. Finally, to completely strip the model tender, the wheels and axles can be prised out by gently bending back the plastic side frames.

The easiest conversion is, without doubt, the Collett design of 3,500 gallon

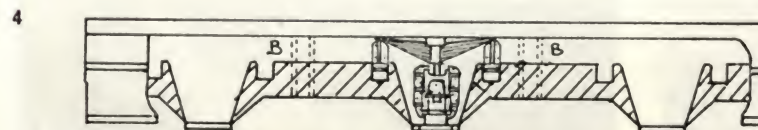
tender. To all intents and purposes this is simply a cut-down version of the Collett 4,000 gallon tender and a presentable model can be made by reducing the height of the Triang-Hornby tender body at the base by 3 mm. Admittedly the rivet details will become misplaced by this treatment but it is submitted that this will not offend the eye too greatly. If it does, then it may be preferable to remove the rivet details altogether. The back of the tender will need some alteration since by removing 3 mm from the bottom edge the handrails and lamp iron detail will be cut into. The opportunity can be taken of removing the plastic handrails altogether and replacing them with wire handrails, in which case it should be remembered to fit them on the corners at the rear and not flat on the rear panel as moulded on the model. The footplate at the front end will probably need to be built up to match that of the locomotive cab. Figure 1 gives an outline drawing of the Collett 3,500 gallon tender but I regret not having a photograph of the prototype to hand. However, anyone sufficiently interested can still see one attached to the preserved Collett 0-6-0 No 3205 now seeing service once again on the Severn Valley Line. Photographs of this star performer appear frequently in the monthly railway periodicals. Collett 3,500 gallon tenders can also be seen in many photographs of GWR 'Saints' and



Drawings are keyed to references in text.



Note that vacuum cylinder from plastic card and sprue fits between first and third wheels—see model pictures.



'Stars' taken in the later years of their life.

The Churchward design of 3,500 gallon tender is perhaps the most widely known and certainly the most common. It is the type modelled by Wills and K's and at one time or another it was to be found in service attached to practically every type of modern GWR tender locomotive excepting the 'Kings'. An outline drawing of the body is shown at Figure 2, which also shows the modifications required to change the shape of the sides. With the Churchward style of side sheets it is necessary to remove the beading around the top edge and raise the top edge by about 0.5 mm (this is not shown on the drawing) and substitute a new beading made out of a strip of 10 thou

plastic card which can be made to go right round the top of the tender. As with the Collett design it will be noted that the forward top left-hand corner of the main body side as viewed from the near-side (see A on Figs 1 and 2) needs to be filled in with plastic card. The footplate will also need building up with plastic card to match the locomotive cab, or it is possible to re-use the footplate which is cut off when the lower part of the tender is removed.

Additional modifications required for the Churchward 3,500 gallon tender concern the underframe and here there is a choice of style. The two most common types of frame are shown at Figures 3 and 4. Either type is possible using the Triang-Hornby chassis as a basis but the



**Top:** This underside view shows the modifications to the underframe and the new coupling peg. **Above:** Completed model tender attached to last month's 'Saint' conversion.

longer spring hangers as fitted to the Figure 3 type call for added modifications which, though not impossible, may impair the appearance of the finished model. Whichever type of underframe it is decided to make, the two pairs of triangular strengthening brackets to the rear of the leading and centre axleboxes should be removed. See 'B' at Figures 3 and 4. A wood chisel is perhaps the safest tool to use for this purpose to avoid damaging the axleboxes, springs and spring hangers with the tool blade. Incidentally, both the two different types of frames are represented by the Wills and K's cast metal kits since the Wills GWR 3,500 gallon tender model has frames as in Figure 4, whereas the K's model has frames similar to Figure 3. Re-assembly of the underframe to the body will require the retaining screw to be shortened by 3 or 6 mm depending on which tender is modelled and also an approximately similar reduction in the thickness of the plastic foam.

A number of further modifications can be made to add detail according to taste. Handbrake columns are an obvious example. Although they are moulded on the model, separate ones such as are available from model shops (and as included in some Airfix locomotive kits) look so much better. The partition at the rear end of the coal compartment should have a slightly curved top instead of a straight one. This can be built up easily with plastic card. The rear buffer beam should really be deeper and the buffers lowered by at least 1 mm but this is rather more of a major operation likely to involve the purchase of a new pair of buffers which may not be considered worth the expense. A vacuum pipe is yet another obvious fitting which can be added. Even though the Tri-ang *Lord of the Isles* and the Airfix *City of Truro* models are no longer available, I hope I have shown that there is still a source of basic material with which to make a model of one of these tenders. If anything, the finished model is a little more accurate in appearance.





The prototype CF-5B shows clearly the all-over silver and red trim used in the CAF. Note the shape of the 50 gallon tip tanks and 150 gallon drop tanks. The 'Canadian Armed Forces' lettering in English and French along with the Canadian Flag can be found on Dri-dec sheet M32

# Canadair's Freedom Fighter

Adapting existing kits of the F-5 to the Canadian-built CAF and NethAF version: details by Graham Wragg

THE external appearance of the Northrop F-5 aircraft has been altered little since the prototypes first flew in 1959, and its shape is increasingly familiar in the skies of the Western powers. Initially designed as a high performance, low cost fighter for allied air forces, the F-5 was accepted, after some initial hesitation, into the USAF inventory. Now 15 allied countries operate the F-5 Freedom Fighter, and two of these, Spain and Canada, are manufacturing their own aircraft under licence.

Canadair in Montreal is producing 115 CF-5 single- and two-seat models for the Canadian Armed Forces and 105 NF-5s for the Royal Netherlands Air Force. The latest modifications and developments in the F-5 programme plus several additional features have been incorporated in the design of the Canadair production lines. For instance, the Orenda-built J-85 engines with additional thrust and louvred intake doors on the fuselage sides combined with a two-position nose wheel, provide the Canadair-built version with an even shorter short take-off capability than previous models.

An interesting feature on the Canadair aircraft is the fitting of an arrestor hook under the rear fuselage, as on the CF-104, used for emergency barrier over-run equipment.

The in-flight refuelling probe will be incorporated in 40 single-seat CF-5A aircraft. To date it has only appeared as a prototype installation on one CF-5A (116704). The system conforms to the installation on the US version, the only difference being that it is located on the starboard side.

The external loads carried on both the CF-5A and NF-5 have so far amounted to 50 gallon peanut-shaped wing tip tanks, and three 150 gallon tanks mounted on the centre fuselage and underwing pylons. These tanks are somewhat bigger and with a different fin arrangement to the tanks provided in the Airfix and Frog F-5 kits.

External ordnance on the CF-5A will most likely consist of Sidewinder missiles on the wing tips. Bullpup missiles and the large variety of other underwing ordnance would be made available in the event of emergency, and the load carrying capability conforms basically to the US versions.

The two-seat model resembles the T-38 Talon and F-5B externally, and is designated CF-5B for the Canadian and NF-5D for the Netherlands. The NF-5D conforms to the NF-5A in colours, roundels, markings and basic patterns. The CF-5B, however, presently being used by the CAF in a training capacity, have no camouflage at all. The overall finish is aluminium silver, with the horizontal stabiliser being red on the upper and lower surfaces, along with panels on the upper and lower surfaces of



Above: The larger 150 gallon drop tanks mounted on pylons are all the same shape. Those provided in the Airfix and Frog kits are the incorrect shape for the Canadair F-5. They can be made from a wooden dowel 1/4 inch in diameter and 2 1/2 inch long. The wing tanks differ slightly from the fuselage tank in that they have an additional vertical fin. Box shown here is from the Airfix kit sold in America—the kit is otherwise the same. Below: 'Peanut' shaped 50 gallon wing tip tanks peculiar to the F-5 aircraft do not come in the Airfix or Frog kits. They can be carved easily from a 1/4 inch diameter wooden dowel 1 1/2 inch long as shown here.



each wing. Large 35 inch roundels are on the upper surfaces of each wing with CAF on the lower port wing and the last three serial numbers on the starboard lower wing, located over the wheel doors in each case.

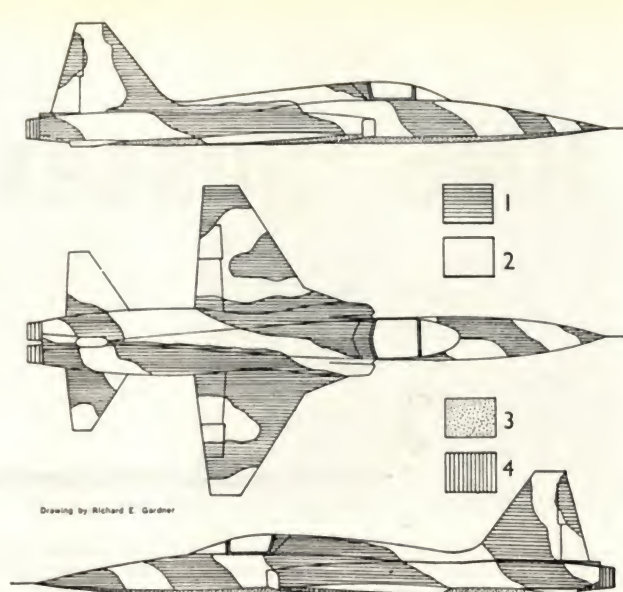
The only exception to the above schemes was on the two Northrop demonstrators. These aircraft, CF-5A (38416), depicted on the Frog box cover, and CF-5B (38445), were both all over silver and appeared with old RCAF markings and Canadian roundels in a variety of odd places.

## Colour Schemes

The single-seat version represented in the Airfix kit is designated CF-5A and NF-5A for the Canadian and Netherlands version respectively.

The colours used on the CF-5 and NF-5 are slightly different but the basic pattern is the same. Variations from one aircraft to another depend on the whim of the individual painter finishing the aircraft. However, the basic pattern is always followed closely. There are no hard lines between any of the colours, a two inch blending band being used on the full-size aircraft.

The CF-5A colours equivalent in shade to Humbrol Matt Sea Grey (HB7) and Matt Dark Green (HB1) on the upper surfaces and a very light grey (HB6) underneath. For modelling purposes and very slight variation can be disregarded. From a distance of more than 40 feet or so, on photographs for example, the upper surfaces nearly always appear to be one colour, due to the use of these two dark shades and the fact that the colours are blended at the edges. Markings are kept to an absolute minimum with



Basic camouflage pattern for Canadair-built Freedom Fighters. NF-5A and 5B: (1) Upper Surface Olive Drab Khaki. (2) Upper Surface Grey. (3) Underside Grey. All colours semi-gloss. CF-5A: (1) Upper Surface Dark Green. (2) Upper Surface Sea Grey. (3) Underside Grey. All colours matt. (4) Silver-bronze (jet orifices).

as on the CF-5A. NF-5A also carries 12 inch roundels on the air intakes and also large 35 inch diameter roundels on the upper port wing and lower starboard wing. These can be found on Stoppel decal sheet No 6 'Netherlands and Portuguese' markings. Twelve inch high black numbers on the nose and four inch high numbers on the fin denote the aircraft's serial number. Numerals and additional markings on Letraset (Dri-dec) sheets M33 and M34 are also applicable to the NF-5A.

Close study of the illustrations here should enable any modeller to finish his Airfix or Frog Freedom Fighter as one of these Canadair-built machines, little more than as a 're-paint' conversion. The arrestor hook can be added from plastic scrap.



Above and below: Detail shots show the arrestor hook partially lowered fitted to all Canadair F-5 aircraft. On the fuselage side just above the trailing edge are the 6 louvres of the engine intake door. These doors are open during take off to provide additional intake air for the Orenda built engines. Note also the small stencil markings and lettering. 'Blending' of the sprayed colour scheme is well shown. Pictures on this page courtesy Canadair, specially taken for this article. More pictures on page 133.



In the foreground is a completed NF-5A, one of 75 being built. Compare the camouflage and markings of the Dutch aircraft with the CAF CF-5As in the background.

12 inch diameter roundels on the intakes and a 12 inch high flag outlined in silver on the fin being the only national markings carried. Suitable styles in 1:72 scale can be found in Letraset (Dri-dec) sheets M31 and M32. In keeping with all Canadian military aircraft, the words 'Canadian Armed Forces' appear in 12 inch high black lettering on the port side with the French 'Force Armées Canadiennes' on the starboard side. Additional numerals and appropriate markings can be found on Letraset (Dri-dec) sheets M33 and M34, though it may be possible to utilise bits and pieces from other transfer sheets. The Dri-dec sheets are the key when finding markings for these particular models, however.

Colours applied to the Royal Netherlands Air Force NF-5A and NF-5Ds are olive drab-khaki corresponding with the green on the CF-5A and lighter Universal Grey (matching Humbrol BR Freight Grey, R111, in fact). The underside is the same light grey

November, 1970



# TAMIYA NEWS

NEW THIS MONTH



Pride of place this month in the ever-increasing range of Tamiya 1/18th scale motorised Car Kits goes to G.103, the LOLA T160 TS. This is a replica of Surtees' fabulous Chevrolet engined monster. Complete with driver, rubber tyres and Tamiya detail, the price of this and other kits in the range is shown on the last page.



The group of US Army Tank crewmen G.129. Some of these are also shown on the DUSTER illustrated above right. Because of their separately moulded arms, these 1/35th scale figures can be built in many different attitudes. A welcome addition to the German Infantry and Tank Crew G.119 and G.118.

We illustrate the box top of the new remote control M-41 WALKER BULLDOG, G.131. This and three other kits in the series at only 39/11 have been released this month. They include the M4 A3 E8 SHERMAN, the RUSSIAN T34 and the SU 100 'JUKOFF'. Look for them, they offer tremendous value.

**U.S. TANK M-41 WALKER BULLDOG** 1/35th Scale Motorised Tank with Remote Control. Price 39/11. Tamiya Model No. G.131.



A short briefing gives the camera a chance to catch some of the detail on G.61, the M42 DUSTER AMERICAN FLAK TANK. Now available at all good Model Shops. Call in and ask to see this and other 1/35th scale models from Tamiya. Attention to scale and detail have helped to make these models amongst the most popular in the world.



The fourth and final kit version of the German TIGER I TANK, G.76, 1/35th scale with remote control. This twin motored version with a new remote control system adds action dimensions to this most popular kit. Also available are G.60 1/35th scale single motor and the gigantic 1/25th scale Tank with interior detail, G.32. The remote control G.73 is illustrated overleaf.

It is incredible what realism and detail can be created even in a 1/100th scale model. Look closely at the BOEING B52F STRATOFORTRESS, G.140 and PHANTOM, G.117 here illustrated. The Tamiya 1/100th scale kits are ideal for those who wish to collect modern model jets but who have only limited space—they are ideal presents also, as they are most strikingly boxed and most are complete with a stand and accurate Decal sheets.



TAMIYA

## PRICE LIST, OCTOBER 1970

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G67	SU 100 Assault Gun—Russian	25/11
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### Tanks—1/35th Scale—Remote Control

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G56	King Tiger—German	59/11
G58	Hunting Tiger—German	59/11
G76	Tiger I—German	59/9
G96	T105 JS.III Stalin—Russian	59/11
G97	Panther—German	59/11
G98	Rommel—German	59/11
G131	M41 Walker Bulldog—American	39/9
G132	M4 A3 E8 Sherman—American	39/9
G133	M42 Duster—American	39/9
G134	T34—Russian	39/9
G135	SU 100 Jukoff—Russian	39/9

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G111	Starfighter F104	5/11
G112	SAAB J35F Draken	5/11
G113	MIG 21 Fishbed	5/11
G114	SAAB AV37 Viggen	9/11
G115	Iroquois	5/11
G116	Grumman Intruder	9/11
G117	F-4E Phantom II	9/11
G141	F-4K/M Phantom	9/9
G142	Ilyushin IL-28 Beagle	9/9
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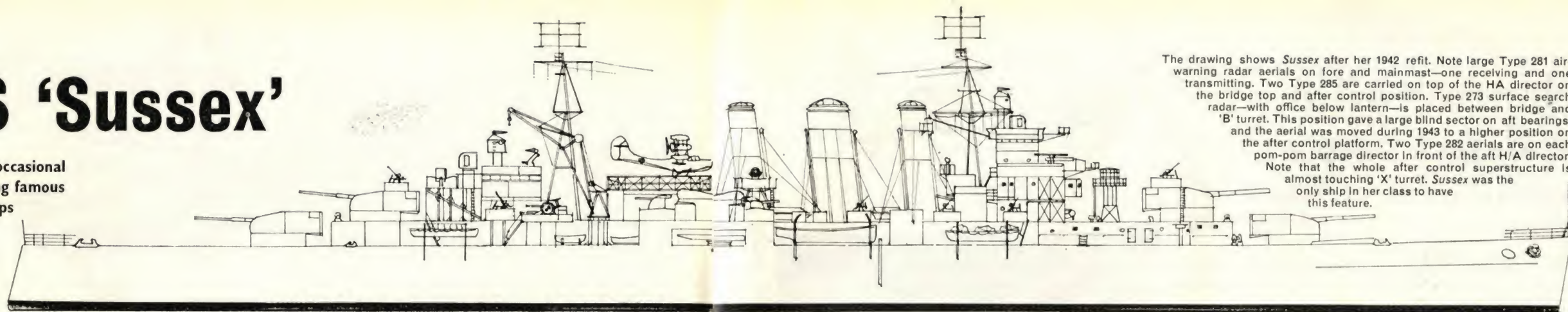
**RICHARD KOHNSTAM LTD. 13-15A HIGH ST., HEMEL HEMPSTEAD, HERTS.**



# HMS 'Sussex'

Second of an occasional series featuring famous warships

1:600 scale



The drawing shows *Sussex* after her 1942 refit. Note large Type 281 air-warning radar aerials on fore and mainmast—one receiving and one transmitting. Two Type 285 are carried on top of the HA director on the bridge top and after control position. Type 273 surface search radar—with office below lantern—is placed between bridge and 'B' turret. This position gave a large blind sector on aft bearings, and the aerial was moved during 1943 to a higher position on the after control platform. Two Type 282 aerials are on each pom-pom barrage director in front of the aft H/A director. Note that the whole after control superstructure is almost touching 'X' turret. *Sussex* was the only ship in her class to have this feature.

HMS *Sussex* was one of the four 'London' class heavy cruisers built under the 1925-26 Estimates, as the second group of 'County' Washington Treaty cruisers. They were designed by Sir William Berry as improved editions of the first *Kent* design by Sir Eustace Tennyson d'Eyncourt.

Like the other 'Counties' the 'Londons' were handsome ships, with high freeboard and three tall funnels. Their chief weakness was their lack of side armour, and even after reworking the *Kent* design there was little that Sir William Berry could add to the sparse deck armour. The chief improvement was effected by giving them internal torpedo-protection in place of the bulges in the 'Kents'. Looking back, it is hard to believe that the DNC could make no economies of weight to allow for vertical protection, but the fact remains that British heavy cruiser design did not achieve any balance between armament, protection and endurance until the *Exeter* and *York*.

On the credit side the 'Counties' had the invaluable assets of endurance (10,000 miles at 11 knots), a strongly built and seaworthy hull, and a well-arranged main armament. Whatever they lacked in a paper comparison with foreign 8 inch gunned cruisers, they proved tough opponents in battle. In all 13 were built for the RN and RAN, of which all saw hard service and three were sunk.

## Modernisation

From 1936, as money became available for re-armament, the 'Counties' were taken in hand for modernisation. The 'Kents' were given an armour belt, enhanced anti-aircraft armament and more elaborate equipment for handling reconnaissance aircraft. Unfortunately the outbreak of war in 1939 meant that only *London* out of the six later 'Counties' could be spared for an even larger reconstruction. She emerged in 1941 as the most radically altered of all, looking like a flush-decked 'Colony' class cruiser. The *Sussex*, on the other hand, owed her modernisation to heavy damage from enemy action. While being refitted by Fairfields in York Hill Basin on the Clyde,

she was hit by a German bomb on November 22, 1940, when the refit was almost complete. Being unmanned and filled with inflammable stores she was very soon gutted by fire and wrecked by an explosion. In order to avoid a major catastrophe the order was given to flood her, and the *Sussex* capsized and sank with hundreds of tons of water on board.

Repairs to damage were carried out by Alexander Stephens & Co, and assisted by John Brown, and lasted until August 9, 1942, a total of over twenty months. When she recommissioned she had substantially the same appearance as before, but her pole masts had been replaced by tripod and her secondary armament was entirely new. A large number of internal alterations were also made, but no armour was added as had been in the 'Kent' class and *London*.

## Armament Notes

The 8 inch guns elevated to 70°, and gave trouble when first installed. Despite references in *Janes' Fighting Ships* to the contrary, the height of the quadruple torpedo-tubes above the waterline caused so much trouble that at one stage it was threatened to remove them.

In 1937 two four-barrelled pom-poms were added abaft the catapult position, port and starboard (the port pom-pom being slightly further aft). This remedied a long-standing deficiency in close-range anti-aircraft firepower. Four additional 4 inch guns were added during this refit, but during the big 1940-42 refit the entire secondary armament was replaced by twin 4 inch and 8-barrelled pom-poms in new positions. In 1944-45 'X' turret was re-

**Note:** The 1:600 scale drawing is a reduction adapted from a very complete set of drawings of *Sussex* available from A & A Associates. The originals are to a 1/16 inch to 1 foot scale and show full hull and fittings. The enlarged views are reproductions from the full size drawings. The complete set of drawings cost 47s (including postage) and is available from A & A Associates, 102 Mattison Road, London, N.4.

moved to offset the weight of four more pom-poms and other gear.

## Service

1st Cruiser Squadron, Mediterranean Fleet 1929-39; South Atlantic 1939; East Indies 1940; refit and bomb damage repairs at Alexander Stephen's yard, Glasgow 1940-42 before joining Home Fleet to 1943, Eastern Fleet 1943-44; refit June 1944-March 1945; 5th Cruiser Squadron 1945-46; Reserve 1946 and arrived at Dalmuir for breaking up on February 23, 1950 (completed January 20, 1955).

## Miscellaneous Notes

In 1942 the following radar sets were fitted: 273, 281, 282 and 285, as well as MF/DF. As completed she carried a Fairey IIIH aircraft, but by 1939 this had been replaced by a Walrus. All aircraft and catapult equipment was removed in 1944-45.

*Article continues on page 133 on the other side of the advertising section; unstaple centre pages to work from drawing.*

HMS *Sussex* at the period depicted in the drawing.



**Laid down:** Feb 7, 1926; launched Feb 22, 1928; completed March 19, 1929; built by Hawthorn Leslie, Hebburn-on-Tyne.  
**Displacement:** 9,730 tons (standard), 13,220 tons (full load).  
**Dimensions:** 595 ft (pp) × 66 ft × 21 ft 3 ins max; 693 ft (oa).  
**Armament (as built):** 8 × 8 inch (4 × 2); 4 × 4 inch (4 × 1); 16 × .303 inch MGs (16 × 1); 8 × 21 inch torpedo-tubes (2 × 4); 4 × 3 pdrs (4 × 1).  
**(1937)** 8 × 8 inch; 8 × 4 inch (8 × 1); 8 × 2 pdrs (2 × 4); 8 × .5 inch MGs (2 × 4); 8 × 21 inch TT.  
**(1942)** 8 × 8 inch; 8 × 4 inch (4 × 2); 16 × 2 pdrs (2 × 8); 10 × 20 mm (10 × 1); 8 × 21 inch TT.  
**(1945)** 6 × 8 inch (3 × 2); 8 × 4 inch; 48 × 2 pdrs (6 × 8); 14 × 20 mm (4 × 2, 6 × 1); no TT.  
**Armour:** 4 inch-1½ inch deck; 2 inch-1½ inch turrets; 3 inch director; plus internal bulges.  
**Machinery:** 4-shaft geared turbines, 80,000 shp=32½ knots; 8 Admiralty 3-drum boilers.  
**Complement:** 664 (peace) 695 (war).  
**Fuel:** 3,210 tons oil.



Model of *Sussex* could be made from Airfix HMS Dorsetshire kit, though many structural and detail changes are needed.

## Flying Jeep—continued

the rotors and rotor head assembly to such a small scale, certain minor amendments have been incorporated in the component parts but this will not spoil the overall effect.

From the plan view drawing trace the outline shape of the rotor blades and transfer this on to a strip of plastic card of the scale thickness of the blades and then carefully cut out the shape from the plastic card—note that the blades are cut as one continuous piece of card from the tip of one blade to the tip of the other. Sand each blade to an aerofoil shape noting while doing so that the leading edge of each blade is the edge which appears straight on the plan view drawing and not that which tapers towards the rotor pivot point.

On to the upper and lower faces of each blade cement small triangles of very thin card—the location of these on the upper surfaces can clearly be seen on the plan view drawing.

Provide the droop in the blades by warming these slightly over a suitable source of heat, firstly experimenting with a scrap strip of plastic of the same overall dimensions as the blades, and while the blades are pliable bend to the shape shown on the side view drawing. As far as the modelling of the rotor head assembly is concerned, Sketch B adequately shows this without any other instructions being necessary except to say that the approximate dimensions of the parts should be measured from the drawings and that the pivot pin should pass through the cabin roof and, if possible, to steady the pivoting of the rotor, it should also pass through the floor of the Jeep.

Care must be taken when locating the holes for the pin to ensure that the tilt of the blades will be as shown on the side view drawing.

**STAGE 5** To complete the model fill any defects not already attended to, with body putty, and after this is set sand the filled parts. The drawing shows the manner in which the prototype was camouflaged and also the positioning of the roundels and prototype markings.

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**Below:** One of the 89 single seat CF-5As being flown by CAF acceptance pilot Captain Frank Gilland on a routine test flight over the Laurentians North of Montreal. **Bottom:** One of the 15 NF-5As being built by Canadair for the Netherlands awaits delivery outside Canadair's Montreal plant. Aircraft are flown over the Atlantic to Twenthe, Holland, being escorted en route by a HC-130 Hercules.







First we show the interior detail included in the 1/25th scale TIGER I TANK. In the cutaway can be seen the driver at his controls and some of the breech mechanism. What cannot be seen is the incredible torsion bar suspension and the authentic cement textured hull. Available with this detail unmotorised, or for slightly more, with twin motors and remote control.



Due for late November! Mainly much smaller in size but with great appeal to aircraft modellers, Tamiya offers aircraft kits of many interesting subjects in 1/50th, 1/72nd and 1/100th scale. We show two versions of the IROQUOIS HELICOPTER built from G.115. Some modellers claim that too little detail can be shown in 1/100th scale.

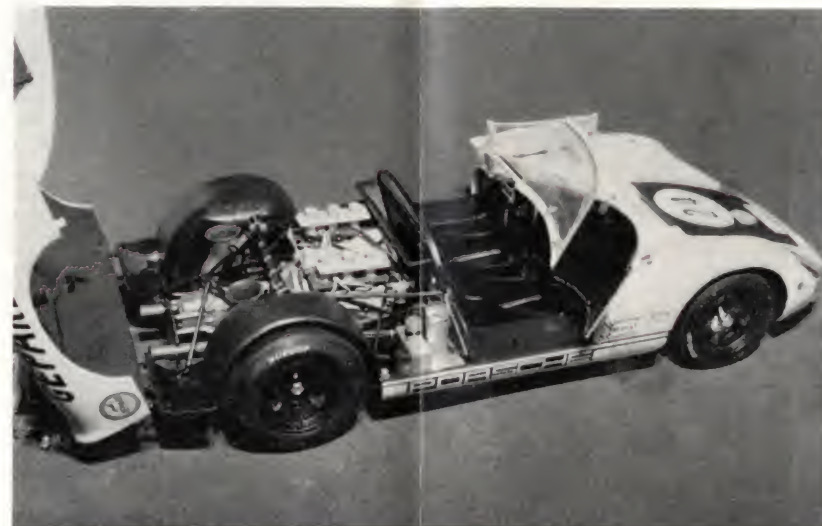
But we invite you to visit your Model Shop and see for yourself the very fine detail and value for money offered in these and every Tamiya kit.



The 1/35th PANTHER TANK. Good kits are essential to achieve models like this. That's why we suggest you buy TAMIYA from the start.



The 1/35th TWIN FLAK AMX 30 FRENCH TANK in a very interesting setting amongst the Pyramids.



We have lifted the engine cover of this superbly built model of the 1/12 scale PORSCHE 910 to show the incredible detail of this fabulous kit. Notice the fine treaded rubber tyres, the electric and fuel lines, even the driver's rear view mirror. This kit is motorised and the suspension also works. The Tamiya 1/12th scale car models are now world famous.



German infantry advancing past a destroyed Tamiya 1/35th Sherman.



Tamiya's fabulous 1/35th scale Leopard.



The 1/25th T34 shows how the suspension on these larger scale models really flexes to every contour of the terrain exactly like the real tank.



Tamiya's 1/35th M8 armoured car and Hunting Tiger in action—or rather in the case of the latter—out of action!



# Heinkel with a flying bomb

Airfix He III conversion with a difference . . .  
by Alan W. Hall

**W**ASTE not, want not—here is a chance to use up at least one of those spare V-1 Flying bombs that come with every Frog Spitfire XIV kit. If you are like me your spares box already has several of them . . .

One answer to the problem at least is to make up a Heinkel He 111 H-22 the aircraft that was specially adapted to carry the Fieseler Fi 103, FZG 76, or V-1 Flying Bomb to give it three of the various names it acquired during 1944.

With the Pas de Calais launch sites overrun the Luftwaffe was forced to find some other method of delivering the V-1 and adapted the already obsolescent He 111 for the first stand-off bomb to be used operationally. III/KG3 became the first Luftwaffe unit to launch the bombs followed by KG53 flying from Venlo in Holland. The success rate was not very high but enough bombs were launched to cause a nuisance. The He 111s flew at a height of about 1,500 feet, pointed the bomb in the rough direction of a large industrial target or city and released it. The bomb stood a good chance of making a hit especially on a target like London or Southampton where most of them went. More than 800 V-1s were launched against English targets but the loss rate for the German bombers was high. British radar and the effectiveness of the Mosquito night fighters made the job of keeping the right altitude and a straight course almost impossible. By the turn of 1944 operations from Venlo ceased due to the steady advance of Allied troops.

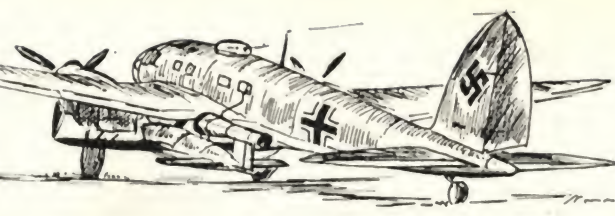
Making a model of the He 111 H-22 is a very simple matter. It is ideal for any beginner with an interest in Luftwaffe subjects and can be produced without any problem from the two kits and by boring a couple of holes.

Painting is however another problem. I was unable to find very much on this subject, there appears to be only one photograph of the aircraft and bomb in my own library this being in William Green's *Bombers and Reconnaissance Aircraft, Volume 9*. This book also contains a two view drawing which was useful. The Profile on the He 111 reveals some interesting detail and the appendices helped me decide on the unit markings. KG53 aircraft were coded A1 followed by the Staffel and individual code.

The various stages in the construction of the model are as follows:

**STAGE 1** The fuselage windows, turret assembly, cockpit interior and tail-wheel are assembled into one of the fuselage halves and given a coat of appropriate black or interior grey/green. Note that at this stage the starboard rear window twin machine guns are the only set to be used—the others giving way to the operating mechanism for the bomb. When the glue and paint have dried the two fuselage halves are assembled and held together with either Sellotape or elastic

*The wing to fuselage joint both above and below the wing needs a great deal of attention. This photograph shows how much plastic body putty had to be added to fill the gaps in the wing roots. At the same time the location hole for the forward radio aerial has been filled.*



Above: A general view of the actual aircraft. Below: The start of the construction. The fuselage has been assembled; so has that of the bomb. Both have been set aside to dry before rubbing down joint lines.



bands for at least five hours until other parts of the construction can start. The wings can also be assembled at this time, so can the tail unit sections and engine s. All parts are left aside to dry. The bomb can also be stuck together and left to dry.

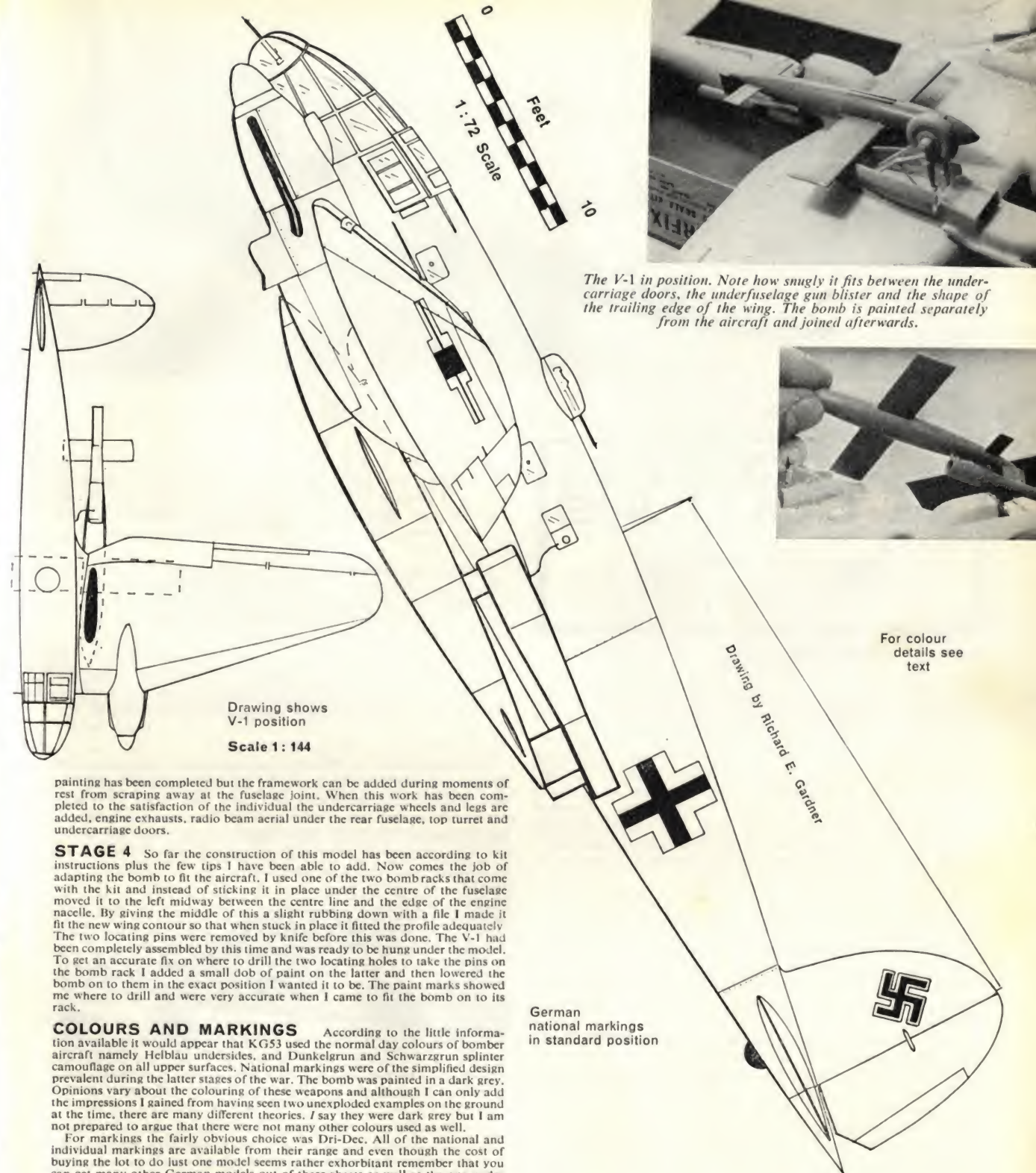
**STAGE 2** After the joint lines on the fuselage and wings have been rubbed down the next stage is to assemble these two parts. In this particular model the joint between the fuselage and wings is a complicated one and in the light of experience Airfix would probably have considered a different way of doing this. As far as the model maker is concerned it means a lot of filling and rubbing down if a model of acceptable standards is to be produced. I simply stuck the two wings into the fuselage slot using a lot of glue, allowed this to dry for a while and then



*Undercarriage assembly. After completing the rubbing down the ancilliary parts are added. Note that the nose canopy is only in place to check that it fits. This part did not get completed until after much painting had been done.*

liberally plastered the whole lot with plastic body putty and completed the job by adding smaller amounts to the forward fuselage radio mast locating hole and around the engines. Particular care must be taken with the area under the fuselage as it is here that the really bad fit occurs.

**STAGE 3** Rubbing down the fuselage/wing joint and cleaning up the other items mentioned can take a long time. To give oneself a rest in between all this hard work the bomb can be assembled and the nose cupola pieces joined by liquid polystyrene cement. The latter is not put into place until after the main part of the



Drawing shows V-1 position  
Scale 1: 144

painting has been completed but the framework can be added during moments of rest from scraping away at the fuselage joint. When this work has been completed to the satisfaction of the individual the undercarriage wheels and legs are added, engine exhausts, radio beam aerial under the rear fuselage, top turret and undercarriage doors.

**STAGE 4** So far the construction of this model has been according to kit instructions plus the few tips I have been able to add. Now comes the job of adapting the bomb to fit the aircraft. I used one of the two bomb racks that come with the kit and instead of sticking it in place under the centre of the fuselage moved it to the left midway between the centre line and the edge of the engine nacelle. By giving the middle of this a slight rubbing down with a file I made it fit the new wing contour so that when stuck in place it fitted the profile adequately. The two locating pins were removed by knife before this was done. The V-1 had been completely assembled by this time and was ready to be hung under the model. To get an accurate fix on where to drill the two locating holes to take the pins on the bomb rack I added a small dab of paint on the latter and then lowered the bomb on to them in the exact position I wanted it to be. The paint marks showed me where to drill and were very accurate when I came to fit the bomb on to its rack.

**COLOURS AND MARKINGS** According to the little information available it would appear that KG53 used the normal day colours of bomber aircraft namely Helblau undersides, and Dunkelgrun and Schwarzgrun splinter camouflage on all upper surfaces. National markings were of the simplified design prevalent during the latter stages of the war. The bomb was painted in a dark grey. Opinions vary about the colouring of these weapons and although I can only add the impressions I gained from having seen two unexploded examples on the ground at the time, there are many different theories. I say they were dark grey but I am not prepared to argue that there were not many other colours used as well.

For markings the fairly obvious choice was Dri-Dec. All of the national and individual markings are available from their range and even though the cost of buying the lot to do just one model seems rather exorbitant remember that you can get many other German models out of these sheets as well as the one under construction here.

Before finally completing the model one small added detail was necessary. This was the umbilical cord from the fuselage to the top of the FZG76 ram jet engine used to start the bomb on its way. I used the existing small hole in the aft window and made a very narrow hole in the top of the engine. A piece of fuse wire completed the job and was just slotted into the fuselage interior and the hole in the engine.

*The V-1 in position. Note how snugly it fits between the undercarriage doors, the underfuselage gun blister and the shape of the trailing edge of the wing. The bomb is painted separately from the aircraft and joined afterwards.*



For colour details see text

German national markings in standard position

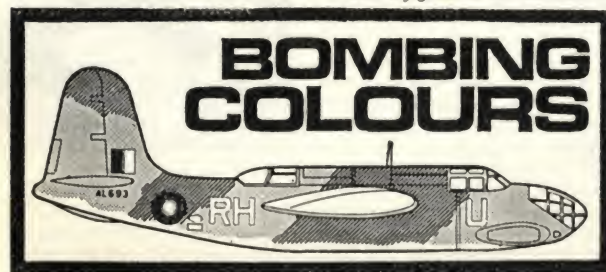
*Photo above drawing shows how the bomb is positioned. One of the bomb racks is shifted to the left and two holes are drilled in the top of the bomb to fit the holes on the rack.*

For model picture see page 152





Blenheim 1 L1295 in the markings it carried in the summer of 1939. Its roundels are all Type B, and there are clear traces of the old Type A1. Also visible is the fuselage unit marking H-107, the aircraft having been used by 107 Sqn between August 1938 and July, 1939. After conversion into a fighter it served with 600 Sqn and 54 OTU (MoD photo).



## Part 20: Bristol Blenheim

NUMERICALLY the Bristol Blenheim was the most important pre-war expansion type. Additionally it was a pacemaker destined to play an important part in the air war at home and overseas, serving to the end of hostilities. It was the first all-metal monoplane monocoque type to be ordered under the expansion programme of the mid-1930s. The ease with which it outran biplane fighters of that era brought their death knell, but the bomber which attracted wide interest on account of its speed was simply not fast enough by the time war came. It had then become the mainstay of the re-equipment programme, eventually serving all Commands, truly a multi-role machine.

Its origin lay in the two-engined fast transports designed by Bristol. Of these the Type 135 of 1933 was stillborn, no suitable engine being available. A year later, after re-design around the Bristol Mercury VI, it was schemed as the Bristol Type 142 to requirements of Lord Rothermere, who was anxious to acquire a high-speed aeroplane for business purposes. Alongside came the Type 143, less advanced in concept.

As R-12, the silver Type 142 flew on April 12, 1935, and was soon at Martlesham for official C of A trials. Here it showed an excellent performance and reached 285 mph at maximum loaded weight. Thus it was faster than the new Gladiator fighter.

Air Ministry asked Lord Rothermere for loan of the aircraft for further trials. In his reply he went one better—he presented the machine to the Air Council and it became K7557 well known as *Britain First*. Bristol looked at the design's military potential. With a crew of two, twin Mercury or Aquila engines, a 1,000 lb bomb load and a range of 1,000 miles, it was an attractive proposition. To accommodate the bombs the mainplane needed to be placed higher,

unfortunately, spoiling the pilot's view. A turret was placed amidships and in July 1935 the scheme was discussed. A specification was drawn up based on the Bristol ideas and agreed in August 1935. On August 22, 150 examples of the new machine, Type 142M to B.28/35, were ordered 'off the drawing board' for it would be some time before any example flew.

During the following winter, consideration was given to expanding requirements for the type. Under re-armament Scheme F it was decided to order large numbers of Bristol 142M Blenheims and Fairey Battles. The other two important bombers, to B.9/32—the Hampden and Wellington—had yet to prove themselves, but the Battle and Blenheim at this time looked quite good and large orders were placed. Scheme F brought into play the Shadow Scheme whereby non-aircraft manufacturers would begin to build aircraft for the RAF. Austins, the motor car firm, were to build Battles and Rootes were to build Blenheims.

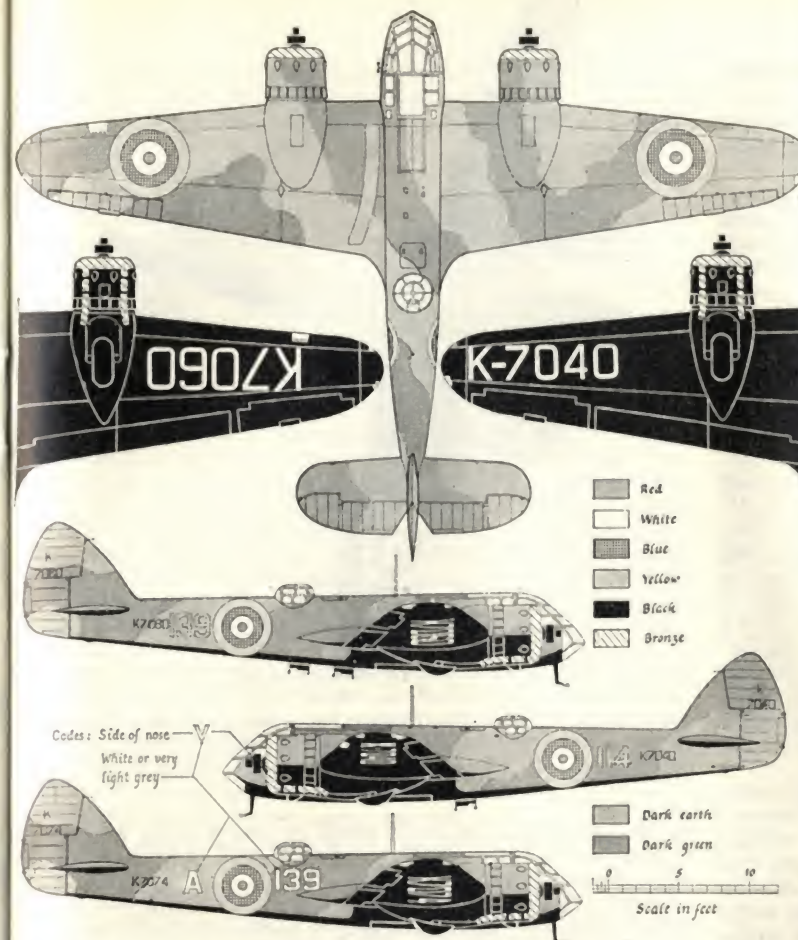
By April 1936, Air Ministry had decided to acquire 1,320 Blenheims of which 620 would be built by a shadow factory. But Rootes seemingly could not fulfil this order so it was decided later that year to bring A. V. Roe into the scheme. By the end of 1936, 1,568 Blenheims were on order. Of these, 568 were ordered from Bristol on June 11, 1936, Rootes were to produce 600 and A. V. Roe 250.



K-7037 shows the hyphenated style of serial applied to the first twelve aircraft. She was supplied to 114 Sqn in March, 1937, and crashed a year later near Wyton.

The first all-silver Blenheim, K7033, flew on June 25, 1936. It had the usual fuselage, rudder and under-wing serials with Type A roundels above and below the wing tips and on the fuselage. On trials it reached a top speed of 281 mph at 12,000 feet at a weight of 11,000 lb. Very few modifications were required before late in 1936 the go-ahead for full production was given. The first batch, K7033-7182, were well under way by the start of 1937 and as soon as turrets were

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Right, top: A flight of 114 Squadron Blenheim 1s with K7045:Z nearest. 114 was carried on these aircraft in flight colour outlined black. The nose letter was white on some aircraft, a very pale shade of grey on others (Flight International). Right, centre: K7078 in the A camouflage pattern has '139' in green outlined black aft of its roundel and 'J' is the same colour on the nose. Photo taken in the autumn of 1937. Right, above: L1243:V of 34 Sqn in the summer of 1938 before passing to 82 Sqn, later that year. She wears the B camouflage pattern (MoD photo).

Above: Blenheim 1s of the Wyton based squadrons. The top view shows camouflage pattern A which the others also wear. K7060 has three-foot serials under the wing, on K7040 they are 21 ft high. Fuselage roundels have an outside diameter of 49 inches, and those above the wings measure 70 inches across. K7060 has red '139' on the side outlined black, K7040 has a red '114' in 18 inch digits like K7060. K7074:A-139 has numbering very slightly off white, a colour also used by 104 and 108 Squadrons at Bassingbourn. K7060 served with 139 Sqn from July, 1937 until February, 1938. K7040 arrived on 114 Sqn in March, 1937 and served the unit for a year. K7074 is shown in the markings it was carrying when it crashed on April 8, 1938. Drawings by A. M. Alderson.

available delivery to squadrons began. In its contemporary state the Blenheim Mk I had a top speed of 285 mph at 15,000 ft, weighed 12,500 lb loaded and had a range of 1,250 miles when cruising at 220 mph. Its crew numbered three, a pilot observer and a gunner situated in the B.I. Mk I turret using a Lewis gun, later replaced by a Vickers K in the Mk III turret. The pilot had a .303 inch gun in the port wing.

By March, the first Blenheims were ready for delivery to 114 Squadron at Wyton. On March 10, K7036 set out for its new home but alas, the pilot braked too hard. It whipped on to its back and was a write-off. Thus, the first to join the squadron were K7036 and '38 which arrived a few days later. No 114 Squadron equipped in March and April, its new machines representing a staggering improvement over the Audax bombers it had been making do with. With their twin-engine safety, flaps, variable pitch propellers and retractable undercarriages, they were quite a novelty since all these things had to be mastered, often after only a few minutes' conversion. Little wonder that as well as equipping new squadrons the Filton line was constantly delivering air-

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craft as replacements for those lost in service. Deliveries were next made to 90 Squadron at Bicester and by August to 139 Squadron at Wyton. Then it was the turn of 144 Squadron.

Something had to be done to update the RAF in the Middle East where biplanes had soldiered on so long. So, with four Metropolitan Air Force squadrons equipped with Blenheims, it was decided to equip No 30 Squadron at the turn of the year, by which time Nos 44 and 110 Squadrons at home had Blenheim 1s. Before the first 150 were flying, Nos 61 and 62 Squadrons also had equipped.

Machines in this first batch were all finished in the customary rough matt Camoutints of Dark Green and Dark Earth with Night undersurfaces upon which were painted white serial numbers. On the first twelve aircraft these appeared in 30 inch high strokes placed at the wing tips and hyphenated like K-7041. From K7045 they took on a more conventional look, being placed further inwards. Another variation on later machines was to have much wider strokes

Continued on next page



## Bombing Colours—continued

in the wing serials. On the rudder and fuselage the black serials were of the usual size and form.

When 114 Squadron equipped with Blenheims it was customary to apply the squadron number to the aircraft's fuselage and on their machines 114 was placed aft. All those recorded by the author had yellow numbers, but it is likely some had them in flight colours. No 139 Squadron certainly adopted this policy.

Individual letters were applied in the same colour ahead of the fuselage roundel and on 114 and 139 repeated on the side of the nose in the same colours, although for a time 114 wore theirs in white. Some of the later squadrons had grey squadron numbers and it seems likely that grey superceded the yellow and Flight colours on earlier ones.

Delivery of the second batch began in March 1938, and deliveries followed to Nos 82, 57, 18, 104, 108, 101, 34, 21, 107 and 44 Squadrons during 1938 in that order. Of these, 44, 104 and 108 Squadrons all had grey unit numbering and letters for certain. In October, examples were despatched to 84 Squadron overseas and later 45, 55, 60, 211, 113 and 8 Squadrons abroad all received Blenheim Is. Many of the machines in the second batch were, incidentally, Mk 1F fighters. Overseas the Blenheims wore the usual Dark Green/Dark Earth/ Night finish with Type A1 roundels. Such information as has come to light upon them seems to suggest that some carried unit number-letter combinations in the normal style; they certainly wore grey individual letters.

When the Autumn crisis of 1938 broke, war seemed imminent and orders were given that home-based Blenheims should have their unit identity markings removed, leaving only the roundels. Some squadrons, including 114 and 139, then applied grey squadron codes. Apparently not all then received codes and a number of Blenheims flying some weeks later were without any unit identity. Another point in which they varied was in roundels. Wyton's seemed all to have Type B blue and red night flying roundels, while at Bassingbourn the old Type A1 were in use into 1939. As with the Battles it seems likely that a reversion to pre-crisis state was never fully made. At the time of the March 1939 crisis, Type B roundels were certainly ordained as a general feature along with code letters, but it would be very wrong to imagine consistency during this period where roundels and code letters were concerned. Additionally, some Blenheims at this time had Type A roundels beneath their wing tips, but again this was not featured by them all. Some also had their squadron crest on a grenade shape on the fin at this time as well as code

Two views of Blenheim IV N6155 of 114 Sqn. It wears Type B fuselage and upper wing roundels, and has grey coded F-FD. The squadron crest is on a white grenade on the fin, and she wears a Type A roundel beneath the wing tip adjacent to the under wing serials. N6155 joined 114 Sqn in May, 1939, and served until the squadron moved to France at the end of the year (IWM photos).



L4842, one of the first batch of Blenheim IVs wearing the A camouflage pattern. It was delivered to 53 Sqn in February, 1939, shortly before the general introduction of Type B roundels. The machine served 53 Sqn during the war and was lost during the fighting in France in May 1940 (Flight International).

letters, and under wing serials which, in time of crisis, were overpainted on some machines and were seen on others to the outbreak of war.

During 1938, re-armament Scheme L accelerated production, although the Air Council was not too happy about ordering vast quantities of Blenheims for their showing against the new monoplane fighters was not so good. Bristol had the Beaufort under way, therefore few extra orders were placed with the parent company. Rootes production was to expand and another hundred were ordered from A. V. Roe. By May 1938, order books stood as follows: Bristol, 818; Rootes, 600; and Avro, 350—total 1,768. Production peaked in September 1938 with 45 aircraft built. The production pattern was altered somewhat when the Blackburn Botha general reconnaissance machine began to look troublesome and additional orders were placed with Bristol. Although its output was not rapid, Avro had its order book boosted to 600. On January 24, 1939, 62 more were ordered from Filton to fill the gap prior to the delivery of Beauforts and in April 1939, 250 more from Rootes. By the outbreak of war all but 50 had been delivered from Filton, 147 had left the Avro works and of the 850 then on order from Rootes, 240 had been built. Orders placed with the parent company before the war may be summarised as follows: 150 on 2.8.35, 568 on 11.6.36, 100 on 12.5.38, 70 on 23.11.38 and 62 on 25.2.39 (cut by 12 later). A total of 250 were ordered from Avro on 22.12.36, 100 on 12.5.38 and 250 on 18.8.39, on which date 250 were also ordered from Rootes. This was far from the end of Blenheim orders, many following after the start of the war. By this time another major version of the Blenheim was in service.

There was an urgent need for a reconnaissance bomber, an interim type before the Beaufort and Botha entered service. Bristol looked into the need and came up with the Bolingbroke. K7072 had its nose lengthened, but the view without

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moving the pilot's seat forward was poor. In September 1937, the first flight of K7072 with its forward nose lowered took place. Still the view over the nose navigation station was not good so the port side of the new nose was scooped to improve the pilot's view. This version, after other changes, emerged as the Type 149 Blenheim IV, production of which commenced late in 1938. Soon the production of the Mk I ceased and the Mk IV was produced in great quantity, after 1,457 Mk Is had been built. The new type had a top speed of about 280 mph, a ceiling of 31,500 ft and a range of about 1,900 miles, this latter figure varying upon the fit of the aircraft. Its loaded weight had risen to around 13,800 lb, however, and even when re-engined with the Mercury XV there was little improvement in speed and performance.

The first Mk IV was delivered from Filton on January 19, 1939. Because this new variant was, from the outset, a reconnaissance bomber, it first equipped Nos 53 and 59 Squadrons. It was March 1939 before the first examples began to replace Blenheim Is. L4865 reached 90 Squadron on March 22, 1939, as the first to join a bomber squadron. No 101 Squadron equipped next. By the end of April the first batch, L4835-4902, was in Service hands. Nos 114, 59, 107, 110 and 139 equipped from the second batch ranging N6140-6242 and 82 Sqn had some from the P48 range before war broke out.

Early Mk IVs wore the same style of camouflage and Type A1 roundels as the Mk Is, and not until summer 1939 were they leaving the works with Type B roundels, apparently introduced on factory aircraft some time after they appeared on those in squadron hands, as was the case with the Whitley. None of the Mk IVs, however, had unit numbers and all wore codes. And like the Blenheim Is they wore A and B Schemes which were applied to alternate aircraft in the usual manner. At the outbreak of war the Blenheim IV formed the backbone of No 2 (Bomber) Group and equipped two reconnaissance squadrons. Many Mk Is were by then being modified into Mk 1F fighters and equipped only five home-based operational bomber squadrons, although overseas they were in use in some numbers.

Below: A flight of Blenheim I's of 44 Sqn. They have grey lettering; 44-L nearest (K7133) wears the B pattern camouflage, and the other two have pattern A; the middle machine being K7130. Photograph taken in May, 1938 (Flight International). Bottom: A formation of 90 Sqn Mk 1s wearing Type B roundels superimposed on the previous style, and grey code letters.



## Summary of the production of the Blenheim I to the outbreak of war

Filton production: K7033-7182, L1097-1546, L4817-4834, L4903-4934.  
A. V. Roe production: L6594-6739.  
Rootes production: L8362-8407, L8433-8482, L8500-8549, L8597-8632, L8652-8701, L8714-8731.

## Summary of the production of the Blenheim IV to the outbreak of war

Filton production: L4835-4902, N6140-6174, N6176-6220, N6223-6242, P4825-4855.

## Pre-war home-based Blenheim bomber squadrons

No 18 equipped April-May, 1938, and based at Upper Heyford. Examples: L1171 and L1177: GU-K.

No 21 equipped August, 1938, and based at Eastchurch, later Watton. Examples: L1280, L1269. Code letters JP. L1279 was JP-L.

No 34 equipped July, 1938, and based at Upper Heyford, moved to Watton then to Tengah in August, 1939. Examples: L1252 with '34' ahead of the roundels and a much larger 'H' aft, all in yellow; squadron motif on a grenade on the fin. L1247 was 34-T and L1243: 34-V. Code letters later used were LB.

No 44 equipped December, 1937-January, 1938, and based at Waddington. Re-equipped with Hampden February, 1939. Examples used: 44-M: K7138, 44-E: K7133, 44-F: K7113, letters etc in grey, '44' aft. Code letters allocated were JW possibly not used.

No 57 equipped April, 1938, and based at Upper Heyford. Examples used: L1146-G and L1171: K both with unit crests on fin grenades. Believed not to have used any number. Code letters allocated were EQ.

No 61 equipped January, 1938, and based at Hemswell. Re-equipped with Hampden in February, 1939. Examples used: K7170-61: V (61 aft in grey, individual letter in grey on outer sides of cowlings as on K7163-61: X and K7160: 61-U). Code letters allocated were LS possibly not used.

No 62 equipped February-March, 1938, and based at Cranfield; to Far East August, 1939. Examples used: L1108-62 ahead W aft in grey, as on L1113-62: W and L1101: 62-R. K7174 was coded JO-L.

No 82 equipped March, 1938, and based at Cranfield and later Watton. Examples used: L1112: A-82 and L1333: OZ-S. Received Mk IV in August, 1939, such as P4829, P4830 coded OZ.

No 90 equipped May-June, 1937, and based at Bicester, moved to West Raynham later. K7050: 90-C, K7054: 90-F used yellow and later grey codes. K7113: 90-D and K7092: 90-K. Later coded TW as on L1283-TW: H and L1285-TW: F. Received Mk IV May-June, 1939, for example L4865.

No 101 equipped June-July, 1938, and based at Bicester, later West Raynham. Examples used: L1244, L1225. Began to receive Mk IV in May, 1939, such as N6165. Code letters LU.

No 104 equipped May, 1938, and based at Bassingbourn. Examples included L1188 and L1195. The aircraft carried 104 ahead of roundels in grey and were later coded PO.

No 107 equipped August, 1938, and based at Harwell, later at Wattisham. Examples: L1290, 1291. Received Mk IV May-June, 1939, including N6174 and N6166. Coded BZ.

No 108 equipped June, 1938, and based at Bassingbourn. Examples included L1202 with '108' ahead of roundels and J aft in light grey. Later coded MF.

No 110 equipped January, 1938, and based at Waddington later Watton. Examples: K7150, K7157, L1204. Received Mk IV June-July, 1939, including N6198: AY-B (AL aft).

No 114 equipped March-May, 1937, and based at Wyton. Examples: K7040: V on the nose with 114 aft also K7041-114: K, K7122: 114-E. Initially this and 139 Sqn opted for unit markings and letter in flight colours, then appeared to favour yellow and in 1938 switched to grey. Code letters were FD as on L1206-FD-H (FD aft). Received Mk IV in April-May, 1939, including N6152, N6153 and N6155: FD-F.

No 139 equipped July-August, 1937, and based at Wyton. Examples: K7078: 139 aft with J ahead; and in 1938 K7074: 139-A in very light grey. Mk IV received July, 1939, including N6216, N6217. Code letters SY.

No 144 equipped September-October, 1937, based at Hemswell, re-equipped with Hampden March, 1939. Examples included L1321, L1322. Code letters if carried were NV.

## Bomber squadrons based overseas and equipped with Blenheim I pre-war

No 8 equipped May-June, 1939, based at Khormaksar. Examples included L1479. Code letters YO.

No 11 equipped July, 1938, based at Risalpur, moved to Tengah August, 1939. Example: L4914. Coded OY pre-war.

No 30 equipped January-April, 1938, and based at Habbaniya. Examples: K7107-B, L4917-B, K7180-V, with grey letter aft. Later coded DP.

No 45 equipped June-July, 1939, and based at Ismailia. Examples: L6628, L6629, L8472. Later coded DD.

No 55 equipped May-June, 1939, and based at Habbaniya, to Ismailia, August, 1939. Example: L1540. Later coded GM.

No 60 equipped June, 1939, and based at Ambala. Example: L8448. Later coded AD.

No 84 equipped February-March, 1939, and based at Shaibah. Example: L4833. Later coded UR.

No 113 equipped May-June, 1939, and based at Heliopolis. Example: L1527, L8447.

No 211 equipped May-June, 1939, and based at Ismailia. Examples: L1480, L8460.

Michael J. F. Bowyer



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# Bofors-Quad

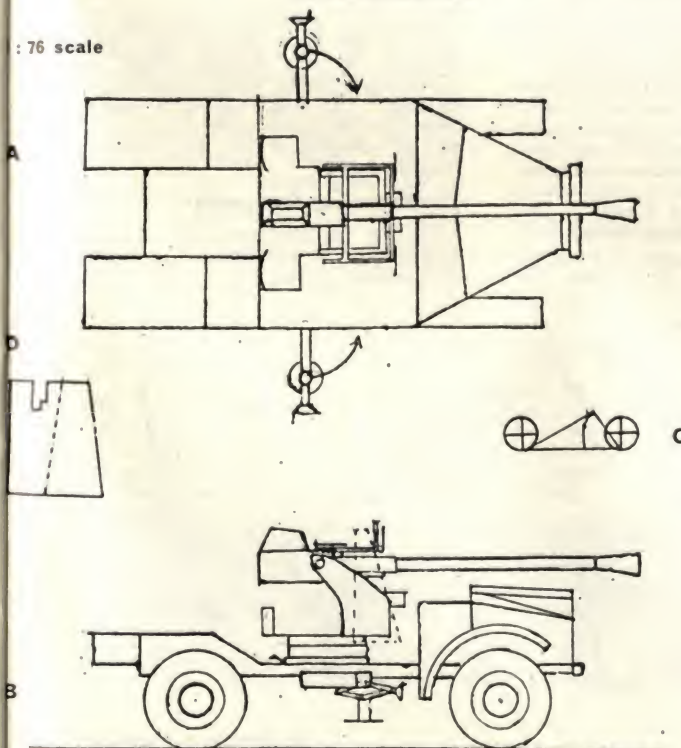
AA defence for miniature armies,  
by Chris Rogers

THIS conversion is based on the Airfix Quad artillery tractor. The chassis/floor assembly is altered to the shape shown in the diagram and the rear axle is sited 5 mm further back and packed with card to its previous level. The sides of the vehicle are cut off as shown, leaving the bonnet sides and cab doors, which are then assembled as in the kit instructions. A sheet of plastic card, the width of the body and the height of the cab sides, forms the cab rear.

The gun itself is made from '88' trunnions and traversing block and '88' or 6 pdr barrels. The article in the October 1967 *Airfix Magazine* \* shows how to convert the Flak 36 part. The sight is from stretched sprue with modified '88' handwheels for the ring sights. The 6 pdr flash eliminator needs to be extended; a Flak 36 hub-cap is excellent for this. The '88' trunnions must be cut down and the traversing block needs its two cylinders cut down and resited, its pivot resited, and a plastic card platform at the rear

\*No longer available but the method is apparent from study of the drawings below.

Below: Full-size drawings show: (A) Plan view of vehicle with jacks extended. (B) Side view with Bofors gun structure apparent; shield position dotted. (C) Gun sight. (D) Shield—two needed bent at dotted line.



(see diagram). Side jacks, shown retracted in the elevation and extended in the plan, are made as shown. The boxes under the rear mudguards are 6 mm x 6 mm x 4 mm.

Details shown on the photograph include a spare barrel on the right, and ammunition boxes stacked on the mudguards. An excellent rolled-up camouflage net can be made from a piece of screwed-up towelling.

The vehicles in the picture belong to 'F' troop (318 Battery) 92nd LAA Regiment and show typical markings.

The reason for all the spent cartridges under the gun muzzle is that the empty cases were ejected into a curved chute running behind and below the gun by means of which they were directed through an opening at the front of the mounting.

Top of page: A fine action view of a Bofors-Quad in action against ground targets, showing crew positions (Imperial War Museum). Below: Two views of completed model showing also the miniature crewmen and the ammunition boxes and camouflage net. Note the sights (item C in the drawing). This much-requested conversion provides excellent 'AA defence' for wargames armies.





# SEVEN WEEK WAR



by ROBERT C. GIBSON

## Part 6: The Campaign

THE Prussian Army in 1866 was organised on an Army Corps basis. Each Corps included two infantry divisions of four infantry regiments, four Jaeger/Schuetzen battalions, four squadrons of cavalry, and a company of Pioneers, plus corps and divisional artillery (horse and foot) and auxiliaries (Train, Telegraph and Railway troops). Cavalry brigades of two regiments were assigned on a Corps or Army basis, as required. For the war against Austria and her allies, the Army was organised as follows:

**1st Army**  
2nd Corps (3 & 4 Div)  
3rd Corps (5 & 6 Div)  
4th Corps (7 & 8 Div)  
Cavalry Division Groeben

**2nd Army**  
Guard Corps (1 & 2 Guard Div)  
1st Corps (1 & 2 Div)  
5th Corps (9 & 10 Div)  
6th Corps (11 & 12 Div)

**Elbe Army**  
7th Corps (14 Div only)  
8th Corps (15 & 16 Div)

**Army of the Main**  
7th Corps (13 Div)  
9th Corps (Landwehr and Reserves)  
Saxe-Coburg-Gotha Infantry Regt  
4th Cuirassiers and 9th Hussars.

The 'Army of the Main' was a detachment of 50,000 troops to deal with Austria's German allies, who numbered about 150,000. The original detachment was built up to 50,000 after Langensalza, by reinforcements from other states.

Prussian infantry carried the Dreyse breechloading rifle, which in trained hands had a rate of fire four times as high as any other infantry weapon used by the opposing armies. Prussian artillery had partially switched to rifled cannon, but still retained a high proportion of smooth-bore weapons of 12 pounder size. (Some breechloading cannon were used, but with dangerous results for their crews.) The tendency to fire off limber-carried ammunition before obtaining reserves limited their usefulness in infantry support, as shown at Sadowa. Prussian cavalry was hardly used in Bohemia; what action they saw was limited by their attachments to the Infantry in 'penny packets', so an accu-

rate assessment of their value cannot be made. Wide use was made of Pioneers (in the crossing of rivers ahead of the main columns), Train Soldiers (as garrisons, suppliers and stretcher-bearers) and Railway and Telegraph detachments. Sutleresses (Marketenderin), dressed after the style of their adopted regiments, followed the columns, carrying refreshments and serving in some cases as nurses.

### The Austrians

The Austrian Army Corps contained four infantry brigades of two regiments and a Jaeger battalion, plus auxiliaries (Train, Engineers, etc.). Cavalry was organised in divisions of five or six regiments (four cuirassier and one/two uhlan regiments, or five hussar regiments). Artillery was assigned to Corps or Division: at Sadowa, all artillery was placed in battery above the river crossings.

Infantrymen carried the Lorenz muzzle-loading rifle, slow to load and slow to fire, and attacked in Napoleonic-style mass formation. The artillery were well armed with rifled cannon, and well-trained in their use. The Austrian cavalry was possibly the best in Europe in 1866, trained to attack in mass formation of cuirassiers and lancers, and to harry and keep surveillance on the enemy. The

Army at Sadowa comprised:

1st, 2nd, 3rd, 4th, 6th, 8th and 10th Corps (infantry)  
Saxon Corps (infantry)  
Saxon Cavalry Division  
1st and 2nd Light Cavalry Divisions (Hussars)  
3 other Cavalry Divisions, including Hosiery and Coudonore Divisions  
Austrian and Saxon Artillery Batteries.

### Saxons and others

The Saxon Army, four brigades of infantry and two of cavalry, was small and highly trained. The infantry held the left wing at Sadowa against superior Prussian forces until the general collapse. Artillery was Prussian, infantry and cavalry Austrian in equipment.

The larger south German states, Bavaria, Baden, Hesse-Cassel and Hesse-Darmstadt, Wurtemberg and Nassau, possessed armies of varying sizes, organised on the Austrian model, but militarily inefficient, and despite their union as a Federal Army Corps, disunited.

The remaining states boasted a regiment or two of infantry, and occasionally a detachment of cavalry. They were:

Saxe-Meiningen (A)  
Saxe-Weimar (A)  
Schaumburg-Lippe (A)  
Schwarzburg-Sonderhausen (A)  
Frankfurt-on-Main (A)  
Reuss (A)  
Waldeck (P)  
Schwarzburg-Rudstadt (P)  
Anhalt (P)  
Bremen/Hamburg/Lubeck (P)  
Lippe-Detmold (P)  
Mecklenburg (P)  
Oldenburg (P)  
Gotha-Altenburg (P)  
Saxe-Coburg-Gotha (P)

Hannover's small army held off the Army of the Main for two days after inflicting the only Prussian defeat, at Langensalza, before being compelled to surrender. The army was of a similar calibre to the Saxon Army, but poorly led in comparison to the opposing Prussian force.

### The Bohemian Campaign

The war was fundamentally a struggle between Prussia and Austria, and since the common frontier lay between Silesia



and Bohemia, it was natural that the main battle would take place here. Prussia had three armies on this frontier in a very short time, helped by the use of good railways and the rapid withdrawal of the Saxons before the Elbe Army to link up with the Austrians in Bohemia. Thus, with no opposition at the frontier, the Prussians converged on a disorganised Austrian-Saxon army from three directions. The Austrians and Saxons fought a series of actions while concentrating, almost by accident behind the Bistritz river at Sadowa, faced by the amalgamated First and Elbe armies, who launched a frontal attack all along the front on the morning of July 3, 1866.

The Austrians foolishly frittered away reserves on the right wing, and the Prussian Second Army fell on this wing towards afternoon, causing a general collapse. Valiant attempts were made by artillery and heavy cavalry to contain the Prussians, but while they succeeded against individual cavalry regiments, mostly light cavalry, they were no match for the well-armed infantry.

The Austrians retreated before the exhausted Prussians, falling back on Vienna, where they regrouped, inactive until the peace treaty.

### The 'Main' campaign

Hannover was requested to remain neutral by Prussia, but refused, declaring war on Prussia, and defeating a Prussian column at Langensalza, where they were

forced to surrender two days later. The Prussian and allied army now advanced on a broad front through Thuringia and Hesse-Cassel without serious opposition. Skirmishes were fought at Dermbach and Kissingen. Frankfurt was besieged and overrun, then the 'war' degenerated into a series of small battles and sieges against isolated detachments of the 'Federal Army', penetrating almost to the Bavarian-Austrian border by late July.

of the sword and lance, as shown at Sadowa by the Austrians.

The main advantage is the countless small actions over vast areas of South Germany and the Austrian Empire between small armies, regiment against regiment, a war of manoeuvre to prevent armies being formed. Thus the would-be wargamer with small finances can choose his own 'army' to suit his pocket and take on others of similar circumstances.



Left to right: Saxon light infantry NCO, Prussian Jaeger officer, Prussian general in cap, Lippe-Detmold's infantryman, Waldeck infantryman, two Austrian German infantrymen, and two Prussian infantrymen in forage cap and helmet. All made from Airfix Civil War, German 1914, or RHA figures.

### War Games in the 1866 period

There is an obvious parallel between the American Civil War and the 1866 War. Use of the railway and the telegraph are common, but other features are unique. Artillery on the Union and Confederate sides was largely outranged by infantry by 1865, but European artillery had profited from this experience, and ranges had become longer. American cavalry was largely mounted infantry, but Europeans still clung to Napoleonic conceptions of the mass charge, and use

### Further study on 1866

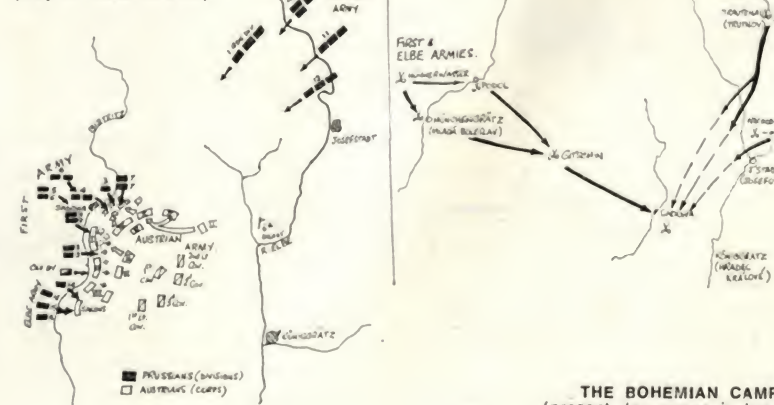
The classic on the Seven Weeks' War is Bomial's *Sadowa*, published in 1907, and still available for a few pounds from military booksellers.

Most public libraries have a copy of the *Battle of Königgrätz* by Dr Gordon Craig, which gives a useful if confusing account of the Bohemian campaign, with some details of regiments involved. The most concise account appears in *A Hundred Years of War* by Dr Cyril Falls (Weidenfeld and Nicolson).

For uniform detail beyond that given, *Handbuch der Uniformkunde* by Knötel and Sieg, written in fairly easily translated German, is a must. Blandford's *Uniforms of the World in Colour* gives a page to the war, and some colour comparison on other pages.

This concludes the Seven Week War series: next month we present the first of a number of articles dealing with simple conversions for the Napoleonic period in OO/HO size figures, starting with British Artillery.

THE BATTLE OF SADOWA  
(July 3, 1866, 10 a.m.)



THE BOHEMIAN CAMPAIGN  
(present day names in brackets)

AIRFIX magazine



Figures made from previous articles. Left to right: Prussian Jaeger officer, mounted; mounted Prussian infantry officer (both from Civil War artillery); Saxon light infantry officer (from Airfix Jap officer), and three Prussian Jaegers (from 1914 Germans).

November, 1970



# STALIN TANK

by

JOHN MILSOM

## Part 3: The IS series

DEVELOPMENT of Soviet heavy tanks reached the stage now where their size called for larger armament than that used on the medium tank, as well as improved speed. Further, the appearance of German 75/88 mm self-propelled artillery mountings presented armour which the KV-1s could not penetrate, and a larger gun was required. Expecting Germany to continue the construction of heavy tanks and gun motor carriages therefore, the gun versus armour race began. The Commissariat for Tank Industry was ordered to undertake a new heavy tank project with increased firepower and immunity.

Towards the end of 1943, 21 different prototypes of tanks and self-propelled gun mountings were built, six of which were passed for quantity production (the two experimental KV variants mentioned in the last part are included in this total). Among these was the heavy tank IS (Iosef Stalin), designed by Kotin, which was a thoroughly revised KV-85. This tank had an 85 mm gun in a new cast turret and a modified suspension and engine, and became known as the IS-1 (IS-85). The tank weighed 44 tons and had a similar turret to the KV-85. The transmission in the tank was perfected, a two-stage planetary mechanism for turning being introduced. Manoeuvre-ability was greatly increased and the average speed rose by 25 per cent compared with the old KV. Older KV chassis were subsequently re-worked into SUs, ARVs and artillery tractors.

This IS-1 was issued to the Army during 1943, but its production was restricted to a small quantity over the end of 1943-beginning of 1944. An up-gunned version appeared during late 1943, called IS-1 (IS-100) mounting a new 100 mm tank gun. This tank was also rejected and in mid-1944 the IS-1 tank was given a new turret with a powerful 122 mm gun (adapted from the corps artillery 122 mm), and was designated the IS-1 (IS-122). Mostovenko, the historian, wrote:

... Even though the 85 mm tank gun was not inferior to the current German 88 mm gun, the 122 mm gun provided the IS tank with a superiority in fire power over all other types of heavy tank likely to be used by the enemy. It was true, however, that the changeover to the 122 mm gun brought about a considerable reduction in ammunition stowage and in rate of fire. Further, design improvements providing a more compact arrangement of components allowed an increase in armour thickness without exceeding the weight of the original KV-1, in spite of the significantly more powerful armament. In all, the increase in general fight-



Above: Rear detail view of the IS-2 (Imperial War Museum).



Top: The IS-85 was the first of the Stalin types. Above: IS-2 was introduced in 1944 but this shows one in post-war service with the Guards badge inside the red star.

ing ability of the IS tank provided the possibility of defeating enemy tanks at greater ranges, of providing stronger armour protection, and an increase in general mobility and performance...

Based on a modified KV chassis, engine and transmission, the IS tank represented a considerable advance from the KV. The driving sprockets, idlers and return rollers were lowered to enable the space between the top of the track and the hull roof to be used for panniers, thereby making possible the provision of a larger turret ring. The hull nose was made in a single casting, and the upper and lower tail plates were made from single plates, each sloped at approximately 45°.

Previous tanks of this type had the armour at the front of the driver made of flat, slanted plates running from side to side, but on this tank a shaped casting was used instead. This casting was faired away on each side of the driver, who was located on the centre-line. The armour casting around the driver sloped upwards as well, so that the frontal portion of the superstructure had a streamlined, rather than box-like, form. In consequence, the superstructure did not attain its fullest width until a point approximately opposite the centre of the turret. Soviet designers also parted from original KV tank design by providing a rear hull plate which had acquired the upward and forward slope once peculiar to the T-34 medium tank. This plate incorporated two transmission servicing hatches. The KV suspension was used together with the standard Model V-2 12-cylinder diesel engine.

The new tank mounted the 122 mm anti-tank gun D-25 Model 1943, together with a co-axially mounted standard 7.62 mm Degtyarov air-cooled machine-gun. The 122 mm gun was a comparatively long one with a German type double-baffle muzzle-brake. The 122 mm of the Stalin with semi-fixed ammunition was harder to handle and yet not as powerful as the 100 mm. A bracket was provided at the hull rear for retaining the gun during travel. Another 7.62 mm machine-gun was ball-mounted in the rear of the turret, and a third was in the bow to the extreme right of the driver. A further machine-gun could be mounted on the turret for anti-aircraft use.

The driver was provided with three episcopes: there was another to the right of the main armament, and one in the commander's cupola on the left of the turret. In place of the pair of gunner's periscopes usually fitted to the right and left of the turret on Soviet tanks, there was only one—on the left. A vision slit with pistol port below was found on each side of the turret, and also in the rear. During 1943, 102 of the IS (IS-122) tanks were produced at the evacuated Kirov plant. This tank was issued to units in late 1943 and appeared in action in early 1944. It was first used in the Spring 1944 campaigns which cleared the Germans from the Ukraine and from part of Poland, and later in the drives from the Baltic States. The Germans felt that the Stalin tank gained 50 per cent increased immunity over the KV through its shape alone.

In 1944, Kotin undertook a complete redesign of the hull of the Stalin tank, resulting in a vehicle with less weight and increased performance. This new model was designated IS-11 (IS-122), and 2,250 of these tanks were produced by the end of 1944. The new model had a modified glacis plate; this entailed the replacing of the stepped glacis plate by a flat sloping type, faired at the sides into the superstructure side plates. This change necessitated a redesign of the driver's vision arrangements. The driver's visor on the IS-1 (IS-122) was replaced by a vision slit and glass block mounted in a bulge on the glacis plate. Otherwise the tank was identical to its predecessor. Mostovenko wrote:

... Employed on the Front during 1944, the IS-2 heavy tank quickly won esteem for its high combat reputation. Experience in combat provided a basis for its modernisation which was carried out at the end of 1944. The basic alteration was in the armour arrangement. The armour was designed from experience gained during the development of the T-34 medium—allowing the new tank to have large angular inclination, contoured or shaped armoured castings and a new streamlined turret—revolutionary feature of IS-3 the final Soviet heavy tank development of the War...

Towards the end of 1944, Kotin designed the IS-111 tank (mounting the 122 mm L/43 tank gun) in conjunction with Shashmurin and Rybin as co-designers. The IS-111 was an excellent tank, but was not supplied to Soviet tank troops until January 1945 and therefore not in time to take part in the war. The IS-111 retained all the advantages of the earlier IS models but had greater armour, a new glacis plate of characteristic shape, and a new mushroom carapace shaped turret. The glacis plate was free from openings and the driver sat with his head right under the turret, on a seat that could be raised or lowered. The driver's periscope was in the hatch cover. The new glacis plate was comprised of two plates welded together so as to form a roof with the apex traversing the centre-line of the tank: this latter feature gave exceedingly good ballistic properties. It was because of this pointed nose that Soviet tank troops called the IS-111 the 'Pike'.

As necessitated by Soviet military policy, handles were welded around the turret for use by tank-borne infantry (Tank Descent). The IS-111 was provided with smoke generators which were mounted in the upper tail plate, and fired electrically. Experiments were carried out with snorkelling IS-111s but no such modification was standardised. Mostovenko wrote:

... The development of heavy tanks over 1941-45 was characterised by the qualitative improvement of fire power and armour protection. The 1941-45 period saw the steady growth in armour thickness increasing the immunity of the hull and turret. Even though the old KV provided immunity to 37-50 mm shot, the armour of the later tanks provided immunity to 78-88 mm shot. In combat potential, the last model Soviet heavy tank was the most successful by comparison with heavy tanks of other nations which appeared during 1943-45.

Below: The IS-3, known as the 'Pike' in the Soviet Army. Post-war feature was the infra-red searchlight on the turret top.





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# photoPAGE

More rare pictures from readers with captions by Michael J. F. Bowyer. A free Airfix kit is awarded for every picture published, but please note that there is usually a delay of some months before publication due to the limited space at our disposal.

All this month's pictures come from reader J. C. Strickland and bring back memories of the 'thirties and the 1939-40 period. Key: (1) Wapitis of 601 and 605 Sqn. 601's aircraft include J8617, K1340, K1342, J9855, K1341, and 605's machines include K1377, J9651, K1343 and K1347. In the front line are 501's aircraft. (2) Wapiti IIAs of 605 Sqn, K1147 and K1343, are shown in this fine view. (3) Hawker Hind K6710, possibly of a training school, with the top decking of the fuselage in Nivo.



Key: (4) Blenheim 1F UF-C of 601 Sqn in the white-black finish of the early months of the war. No belly gun tray is fitted in this instance. (5) L6724 and a line up of Blenheim 1Fs of 601 Sqn early 1940. (6) Imperial Airways' Armstrong-Whitworth Ensign G-ADSX in wartime markings and camouflage, 1940. (7) Detail of a Hawker Hart, unit unknown, in 1938.

## 'Leander' Class—from page 122

the horizontal position (drawing S) and also the (hinged) whip aerials in the after corners of the Seacat deck.

The 'stowed' positions for the armament are as follows:

(1) 4.5 inch turret—fore-and-aft at 5 degrees elevation; 4.5 inch director—fore-and-aft; Oerlikons—barrels outboard at zero elevation; rocket launchers—outboard; Bofors—trained aft at 30 degrees elevation; Seacat director—facing aft (in harbour), forward (at sea); Seacat launcher—upright as modelled or facing aft at 45 degrees elevation; A/S mortar—upright and angled forward (ceremonial), 45 degrees to port and angled aft ('Flying Stations'). Note: the horizontal position in the kit instructions is the 'Load' position.

(2) Flags and Ensign. Union Flag—on jackstaff, in harbour only or ceremonial occasion at sea. At sea, the jackstaff is removed and its tripod collapsed. White Ensign—on ensign staff aft, in harbour and entering harbour; staff removed at 'Flying Stations', and Ensign flown from foremast gaff (usual position at sea).

(3) Draught marks. Vertically upwards from the stem to 4 mm below the anchors; above propeller shaft glands and above propellers to 4 mm below deck edge.

(4) Inflatable Assault Craft. One of these is carried occasionally and is best modelled by using a Carley Float from the spare parts box.

### Painting scheme

Light grey All superstructure unless otherwise detailed—including the anchors! (Note: paint the 'rim' of the two hull sections before cementing the deck (4) in position, to give 4 the correct grey border.); breakwaters, hatches and deck ventilators; all lockers and fittings.

Green All decks, including bridge roof, mortar well and Sonar pocket *except* the Flight Deck; starboard navigation light.

Dark grey Flight Deck from after hangar bulkhead to forward edge of mortar well.

White Bollards and fairleads on deck edge; cable hawse-holes and cable-holders on fo'c'sle; cables; wind dodger on ECP; life-rafts; after capstan; main topmast and aerial (34); Radar reflectors on directors; jackstaff and ensign staff tripods; draught marks on boot topping, 'Bosun' deck; Flight Deck safety nets.

Black Funnel top; boot topping (1.5 mm wide); 4.5 inch gun barrels; other gun barrels (if fitted); after face

Red Seacat missiles; port navigation lamp; bases of whip aerials abreast funnel; 'Bosun' dinghy hull.

Yellow Sonar towed body; Seacat launcher centre boss; tips of main rotors.

Brick red Hull below boot topping; fo'c'sle, forward of cable-holders (optional).

Silver Muzzles of 4.5 inch guns; forward edge of 4.5 inch mantlet plates.

Bronze Propellers; muzzles of mortar barrels; tips of Jack and Ensign staffs.

Wasp helicopter Overall dark blue; grey main rotor blades; white dots on nose to represent squadron number; small white circle on fuselage side with red dot to represent roundel; black landing wheels; white dots on tail boom to represent 'Royal Navy' marking.

Boats Above waterline—any colour except green (reserved for Cs-in-C). Below waterline—white. Decks and canopies—'varnished wood' effect, or white. Note: 'Bosun' hull can be any colour—including green—but red provides the best contrast effect.

### CLASS LIST IN ALPHABETICAL ORDER

Name	Pendant No.	Name	Pendant No.
Achilles	12	Euryalus	15 (B)
Ajax	114 (B)	Galatea	18 (B)
Andromeda	57	Hermione	58
Arethusa	38	Juno	52
Argonaut	56	Jupiter	60
Aurora	10 (B)	Leander	109 (B)
Bacchante	69	Minerva	45
Cleopatra	28	Naiaid	39
Charybdis	75	Phoebe	42
Diomedes	16	Penelope	127 (B)
Danae	47	Scylla	71
Dido	104 (B)	Sirius	40

NOTES: (1) Two further ships are building on the Clyde. (2) (B) indicates ships fitted with Bofors in lieu of Seacat. (3) All pendant numbers have flag F superior. (4) It will be noticed from the above that *Leander* is in the 'Bofors-fitted' group and should not, therefore, be modelled with either the Seacat launcher or its director.

## NEW BOOKS

### REVIEWED FOR MODELLERS

#### Tank Books

ARMoured FORCES, by Richard M. Ogorkiewicz. Published by Arms & Armour Press, 677 Finchley Road, London NW2. Price 60s.

THE TANK, by Douglas Orgill. Published by Heinemann, London. Price 63s.

THE first of these two books is a new edition of the very important *Armour*, first published ten years ago but now given a more explicit title. This is the classic general history of AFVs and if you can afford only one big book on tanks, this is the one to get. Very readable and amazingly comprehensive for a single general history, it is virtually essential reading for anyone taking a keen interest in tanks, either models or the real thing.

In nearly 500 pages, it covers tactics and organisation, development of tanks country by country, and equipment, design, and components. Highly commended. The second book is also a broad history, very well written, which covers the use of tanks in war, the personalities and the campaigns, rather than the pure technical or development side. For anyone who, in a single volume, wants the background to the more technical 'nuts and bolts' side of the subject, *The Tank* is worth having.

#### Locomotive Profiles

LOCO PROFILES: No 1, LNER NON-STREAMLINED PACIFICS; No 2, NYC 'HUDSONS'; No 3, GWR 4-CYL 4-6-0s; No 4, AMERICAN 4-4-0s. Published by Profile Publications Ltd, Coburg House, Sheet Street, Windsor, Berks. Price 6s each.

THE idea of 'Loco Profiles' following on aircraft, cars and tanks seemed an obvious one but one wondered what their form would take and whether anything new could be said to justify their introduction considering the wealth of railway literature covering the more popular aspects of railways already published. There need never have been any fear judging by the first in the Loco Profile series which features Gresley's non-streamlined pacifics (the title is perhaps misleading since the Raven, Thompson and Peppercorn pacifics are not featured). A total of 34 interesting photographs are reproduced in the 24 pages and in addition

Continued on next page



there is a double-page centre spread, full colour drawing showing the Class A1 built to the original GNR loading gauge compared with the A3. The drawings to 4 mm scale show the two locomotives in LNER livery which is very well reproduced. The text is very informative and, amongst other things, gives very detailed accounts of the modifications which affected individual members of the class which is of great assistance to modellers. The subsequent issues listed all follow the same basic style, the 'Hudsons' and GWR engines ('Kings', 'Castles', 'Stars') are particularly well done. The issue on American 4-4-0s is perhaps less successful as it covers such a vast subject in one book rather than concentrating on a few examples of the 4-4-0 breed. It is well done nonetheless.

## Uniforms

**JAPANESE ARMY UNIFORMS AND EQUIPMENT, 1939-1945.** By Roy Dilley. Published by Almark Publishing Co Ltd, 104-106 Watling Avenue, Edgware, Middx. Price 17s 6d (paperback) or 25s (hardback).

WRITTEN by Airfix Magazine contributor Roy Dilley, this handy little volume fills a gap in available reference books by providing virtually all the average modeller or enthusiast needs to know on the Japanese Army in World War 2. Very full coverage of uniforms includes many drawings and extensive colour plates from wartime US intelligence sources. Apart from this, infantry organisation, tactics, training, small arms and heavy infantry weapons, are all covered with a wealth of illustrations and data. It is an ideal book for anyone converting or painting model Japanese soldiers like those made by Airfix.

## Locomotive histories

**STANIER LOCOMOTIVES—A PICTORIAL HISTORY,** by Brian Haresnape. Published by Ian Allan, Terminal House, Shepperton, Middx. Price 42s.

THIS is a splendid book worthy of the subject matter it portrays. The photographic coverage is excellent in quality and quantity and all classes of Stanier locomotives with their many individual modifications are portrayed. Some of the early LMS photographs showing experimental boilers, chimneys and fittings are particularly noteworthy. Very full captions are provided and there is also an informative text which, amongst other things, gives details of each batch of locomotives constructed. The format consists of a separate chapter for each locomotive class in the order of their date of introduction. Well recommended.

## For wargamers

**LITTLE WARS,** by H. G. Wells (facsimile reprint). Published by Arms & Armour Press, 677 Finchley Road, London NW2. Price 34s.

**WAR GAMES CAMPAIGNS,** by Donald F. Featherstone. Published by Stanley Paul Ltd, 178-202 Great Portland Street, London W1. Price 35s.

**BATTLES WITH MODEL SOLDIERS,** by Donald F. Featherstone. Published by David & Charles Ltd, South Devon House, Newton Abbot, Devon. Price 55s.

WE frequently receive requests from readers for lists of books on wargaming. Here are three new ones which between them provide a wealth of material for any enthusiast of the wargaming hobby. *Little Wars* is a classic in its own right and is the original work which started the hobby of wargaming in its twentieth century form. First published in 1912, it featured wargaming with Britain's lead model soldiers and guns (then the most widely available models) which were, of course, all 54 mm (1:32) scale. The H. G. Wells rules were delightfully simple and using this book anyone with modern plastic 54 mm scale model soldiers (or even Tamiya tanks) could set up a wargame. One attraction of the Wells rules was 'real' gunfire in the form of matchsticks fired from Britain's cannon. Modernists may have to modify the rules here. This reprint is very neatly done and the



Excellent modelling by reader Harold von Haeseler of Lübeck, Germany, who super-detailed this Airfix Royal Sovereign complete with full rigging and fine painting.

book makes a most attractive and absorbing addition to the wargaming library.

A modern wargames writer is Donald Featherstone, author of several previous books on the subject. His *Battles with Model Soldiers* makes a very complete volume on the subject which is particularly useful for newcomers to the hobby. Chapters offer simple rules for every popular period up to World War 2, there are illustrated demonstration battles, chapters on scenery, choice of models, converting figures, lists of books and suppliers, and so on. In short, a most excellent coverage of the subject. *War Games Campaigns* is for the more advanced enthusiast and goes deeply into tactics, maps, long-term strategy and simulated campaigns based on actual campaigns. It is packed with ideas and valuable tips for the wargamer who wants to proceed beyond basic battle games.

## For spotters

**BRITISH RAILWAYS LOCOSHED BOOK.** Published by Ian Allan Ltd, Terminal House, Shepperton, Middx. Price 3s.

THE 1970 edition listing all BR locomotives with their depot allocations as at Autumn 1969 can be spotted on the book-stalls by its yellow cover, black and red lettering and silhouette drawing of three locomotive cabs. Recent withdrawals of some diesel locomotives has reduced the fleet list by one page from the previous edition. All the photographs reproduced on the 16 art pages are new.

## Traction engines

**THE 1970 TRACTION ENGINE AND ORGAN ENTHUSIASTS' HANDBOOK.** Published by Traction Engine Enterprises, 4 Station Road, Chingford, London E4. Price 3s.

WE apologise for being a little late drawing readers' attention to this book. Traction engine enthusiasts, lovers of fair-ground organs, model engineers, and anyone who has ever attended a traction engine rally will welcome this modest 48 page typewritten publication which gives a wealth of information about clubs and societies, museums and rallies and events of interest held during 1970.

**TRACTION ENGINES WORTH MODELLING,** by W. J. Hughes. Published by David & Charles, South Devon House, Newton Abbot, Devon. Price 50s.

IT is often said that the best way to get to know a subject is to make a model of it. It is perfectly true so far as this manual for model engineers is concerned since in describing various construction methods for the model engineer it also gives a clear and concise account of the working parts of traction engines. Six distinctly different types are described and illustrated in detail and there are also chapters on general features common

Continued on page 154

# NEW KITS AND MODELS

## FROM TAMIYA

LATEST military kits received in the Tamiya 1:35 scale range are both of German World War 2 prototypes. Priced at 13s comes a very fine little model of the Volkswagen Schwimmwagen, easy to assemble and beautifully moulded. It is complete with an officer and two seated figures, and Roy Dilley used the officer from this kit in his Japanese soldier conversion last month. A neat little transfer sheet is included giving Waffen-SS, Army, or Luftwaffe markings, plus the appropriate emblems for the crews' helmets. Fine detail includes small arms and tools for the vehicle. Highly commended this kit, especially for those needing a gentle and inexpensive introduction to larger scale military modelling. Incidentally, though the disparity between 1:32 (British) and 1:35 (Japanese) scales is usually overlooked by collectors, the small size of the VW really does make it too small to look fully at home with 1:32 scale models of the same comparative type.

Second model, at 45s, is a 1:35 scale Tiger tank which is virtually a straight reduction of Tamiya's 1:25 scale model except that the interior detailing is omitted. Much of the historical text on the instruction sheet is the same, in fact. The motorisation is also different, of course, with a straightforward forward/stop/reverse gearing (the gears come ready assembled) and three U-11 batteries (not supplied) in the rear hull. The torsion bars come ready moulded in place, so assembly is relatively easy—easier than most 1:35 scale tanks. With scale type tracks and fine transfers, this kit should not be missed by tank fans.

Both our samples came from Jones Bros of Chiswick, who can supply by post, postage extra. C.O.E.

## TRANSFERS

THREE new transfer sheets have been issued in recent weeks from Model-decal. These are all to the exceptionally high standard set previously by this company. The three sheets are for (No 5) a Focke Wulf Fw 190D-9, Fiesler Fi 156C Storch and Dornier Do 217E-4, (No 6) a F4U-1 Corsair of VF-17, a SB2C-3 Hell-diver of VB-7 flying from the USS Hancock, and a landplane undercarriage version of the Kingfisher. Sheet No 7—perhaps the most interesting of the three for British modellers—contains markings for a Hunter of No 14 Squadron, a Meteor F4 of No 63 Squadron, squadron badges and insignia for a Harrier of No 1 Squadron and markings for a Phantom FGR2 of No 6 Squadron. The latter has alternative letters and figures to make up other aircraft on the squadron. Each aircraft depicted has a decal for the instrument panel in the cockpit, two in the case of the Phantom. With the production of very clear cockpit transparencies by some manufacturers, this additional transfer

will be of great use.

In looking at these latest offerings and comparing them with published and private reference material there is very little one can criticise. They adhere well to the model (even on all silver surfaces) and the colours are an accurate match with the real thing. Although the stencil lettering provided for some of the aircraft is rather small, examination under a magnifying glass will reveal the actual wording in sharp outline. When transfers reach this sort of standard there is nothing that one can say apart from thoroughly recommending the purchase. The cost of the German sheet (No 5) is 5s 3d, and the other two are 7s 6d each. They can be obtained from Modeltoys, 246 Kingston Road, Portsmouth.

On a par with the Modeldecal transfers but in rub-down variety, Dri-dec have recently brought out three new sheets. Amongst these is a six-colour offering of Luftwaffe unit emblems and Gruppe markings. Aircraft for which markings are included are Bf 109s, Fw 190s, Bf 110s, Hs 123 and Hs 129. A line drawing showing the position of the insignia is given with the sheet.

Retailing at 7s 6d, these transfers are printed in exact register. The colours are accurate and although small can impart an excellent finish to any model. Care will obviously have to be taken in application and junior, or the more inexperienced model maker, will have to get in a little practice before making a first attempt on the real thing.

As with Modeldecal, one can find little to criticise in the Dri-dec issue. Once laid on the model they will not shift, even under water, and the only way to get them off is by rubbing a piece of Sello-tape over the marking and lifting it quickly. Other sheets in the recent release are Nos 37 and 39 which give Luftwaffe bomber codes and stencil markings in black and Luftwaffe squadron codes, letters and numbers in green respectively. The unit markings described are No 38 in the series. Several of the larger retailers hold stocks of Dri-dec transfers but they can be obtained from The Model Shop, 19 Market St, Newbury, Berks. A.W.H.

## FUJIMI HAWKEYE

THE Grumman E-2A Hawkeye, AEW aircraft, is one of the largest carrier-borne machines in the US Navy's inventory as well as being probably one of the oddest looking. Fujimi, the Japanese manufacturer famous for their 1:50 scale kits, have departed from this scale to the more popular 1:72 for their interpretation of this important aircraft which acts as the eyes of the fleet. This change of scale by no means reduces this manufacturer's high standard, and the exquisite detail they manage to include in their larger kits is just as apparent in the Hawkeye.

The kit is moulded in white polystyrene



with accurate and not overdone surface detail. Apart from some flash around the beautifully detailed propellers, the review sample was remarkably 'clean', and all parts fitted with such precision that a minimum of filling was required, this being mainly confined to the engine/wing joints and the radar scanner rear support struts. Care must be taken in aligning the inboard two fins and rudders to ensure that the correct angle is achieved. Although the scanner is made to rotate, it was found best to cement this in place, otherwise it adopts a list to port or starboard. A unique feature of this kit is the inclusion of a fair quantity of modelling clay to add the weight necessary for the Hawkeye to stand on its well-detailed undercarriage. Instructions are in English and Japanese and an impressive addition to these is the inclusion of several photographs of the full-size aircraft.

The transfer sheet is one of the best yet seen in a kit and includes a choice of markings for aircraft operating from the *America*, *Constellation* or *Coral Sea*. The only fault on the sheet is that some of the lettering of the stencil markings is incorrect, ie, 'JAT BLAST' instead of 'JET BLAST', but these are minor and can be rectified.

This remarkable looking aircraft makes an unusual addition to any 1:72 scale collection. The price is 30s, postage extra, and the kit is imported by Dri-dec of Newbury. B.P.

## NEW SLOT RACER

FOLLOWING what has already been done before by members of some slot racing clubs, Riko are producing a complete 1:32 scale car kit reduced to the bare essentials. This is known as their Sideliner kit and employs a skew mounted motor, and pivoted guide shoe mount. The chassis is quite a neat little effort constructed from rod, tube and plate. The mounting for the motor also carries the tube housing the rear axle bearings. The front axle also runs in a tube attached to the upturned ends of the chassis. Small pivoted plates on each side of the chassis have upturned holes for body mounting. The pivoting is controlled by a small transverse rod. The chassis is very light and robust and has a plated finish. The motor is one of the potent Mabuchi series, and the power/weight ratio is quite something.

Continued on next page



## New Kits—continued

The nylon guide shoe is attached to its pivoted mount in the usual manner with a set screwed collar. The method of fitting the pick-up braids and motor leads is not very clever. They push into slots in the guide which are too large and need some additional packing to make good electrical contact. Also the motor leads on our sample were rather short. The wheels are threaded on to the axles and are held in place by lock nuts, as is the gear wheel. Plastic spacers are provided to give adjustment to the car's tracks. The rear tyres are the soft treadless type favoured by the experts and the fronts are smaller and harder. The body is a one-piece clear plastic shell and needs the paint brush to convert it. Also the 'driver' needs a head.

A criticism of the kit is the motor attachment. The heads of the fixing screws are too small and there is no room for a suitable washer. With a motor of this size something more positive is needed.

This is obviously an enthusiast's kit and with a small amount of attention should prove highly competitive on a slot circuit. Our sample came from Riko and is available from model shops stocking slot racing equipment. Our small criticisms apart, this kit is obviously first-class value at its very modest price of 49s 11d. Various bodies are available, including the Hillman Avenger. **B.L.**

## BOAT FITTINGS

A NEW range of boat fittings has been released by Riko. Although of varying scale they should prove very useful both to scratch builders and for modifying and converting plastic ship kits. The range includes various sizes of ladders, ships' rails, stanchions, bollards, port and starboard lights and searchlights (all with fitted bulbs), ventilators, cleats, anchors, etc. On the mechanical side there are some neat little reduction gearboxes, flexible drives and gear levers cum switches. These could be used in practically any boat. There is also a very neat double winch mounted on ½ inch square base which will save a lot of trouble as these are always difficult to make unless a lathe is available. The fittings are metal, cleanly finished, and rust-proof. Also in the range and not necessarily associated with boats, are two types of neon street lamps complete with bulbs and model railway fans may find a use for these. This Riko range of boat fittings is now available from most big model shops. Prices start at 1s 6d, and a typical item, a Danforth anchor, costs 5s 6d. **B.L.**

## CESSNA A-37A

ONE of the most recent additions to the Hasegawa range of 1:72 scale aircraft is the Cessna A-37A COIN aircraft. This model follows the usual high standards set by this manufacturer and although rather diminutive, makes up into an attractive model. The fit of the parts is quite exceptional and there was little evidence of flash even on the smallest components. The cockpit transparency is a joy to behold and the spacious 'office' will keep the super detail enthusiasts busy for many an hour.

Full underwing stores are included which when fitted show the remarkable payload of this small aircraft. Transfers give a choice of both styles of markings used in Vietnam and are complete with codes and i/d markings. The only omissions are the aerials shown on the excellent box-art, but this fault is easily remedied with stretched sprue. The kit costs 9s 6d and is imported by Dri-dec of Newbury. **B.P.**

## HEINKEL 51A

BIPLANE enthusiasts will fall in love with this kit which must be one of the best yet produced by Hasegawa. Detailing is very much in character with this early Luftwaffe fighter and the simulated fabric covering is extremely well done. Instructions are clear and concise, with a coloured three-view drawing on the back of the box—in the Frog style—leaving no doubts as to the finish required.

The only problem encountered with the review sample was the alignment of the cabane struts which appear to be numbered incorrectly on the exploded drawings. As the instructions are in Japanese it is difficult to verify this, but careful trimming with a modelling knife soon solved the problem. Price of the kit is 7s, which is good value for such a delightful model.

Like the Hawkeye and Cessna, the He 51A is stocked by Dri-dec, 19 Market Street, Newbury, who tell us that they are importing these kits in small quantities, and have already been inundated with orders. Initial stocks were soon exhausted but further supplies should soon be available. Dri-dec allocates a code number to orders received so that receipt of kits is in strict rotation. The two month wait that may be necessary to fulfil orders is well worthwhile. **B.P.**

## OTAKI ALFA ROMEO

WE have recently received a sample kit of the Otaki Alfa Romeo Coupe 33. Otaki specialise in the larger models, the Alfa being 1:16 scale. This prototype sports car is quite an exotic machine in typical Italian style and this is well reproduced as a model. Nearly everything that is visible on the original is in the kit, down to quite small detail.

The model is motorised using a Mabuchi electric motor mounted forward on the chassis and accessible when assembly is complete. So it could be replaced if the need arose. The drive to the rear wheels is via a very ingenious gearbox with half shafts working on the swing axle idea: the whole box is enclosed in a replica of the prototype's power unit. Independent suspension is provided on all four wheels by coil springs.

The model carries a complete lighting system, both front and rear lamps being fitted with lenses. It is controlled by a small switch mounted on the floor and operated from underneath. The batteries (the only item not supplied) are fitted under the door sills completely out of sight but are easily replaced from beneath the model. Incidentally, the floor

is in two parts, the top half being a cover for the 'works' so that the interior is correct with a well detailed dashboard, handbrake, pedals, etc.

All the pieces of the kit are cleanly moulded and well finished in red, black and chrome where appropriate. The windows and headlight fairings are separate pieces. If one wants to add a final touch, then a paintbrush will do the necessary but a look at the original is essential. One feature that is missed on a model of this size is the chrome trim round the windscreen, etc. There is undoubtedly a production difficulty in this, but there is a proprietary material on the market, Metaskin, that could be used.

The instructions with 56 sketches of step-by-step assembly diagrams also include an English text. Our sample was supplied by Richard Kohnstam Ltd, the importers. It costs 79s 11d. **B.L.**

## PRINTS GALORE

RECENT months have brought a spate of new prints and drawings of various kinds, and mention of some of these has been delayed by lack of space. However, a portfolio from Lamo-Lem Prints, PO Box 445, Del Mar, Calif, 92014, USA, features the Eastern Front Campaign in a series called 'Armor in Action', one of five such sets available. The portfolio has four different pencil type action scenes involving Russian and German tanks, printed on heavyweight paper. The folder includes lengthy descriptive captions. Price of the portfolio is 21s, post paid.

Our contributor, G. W. Futter, of 31 Coppice Road, Woodley, Berks, is offering a fine series of scale military vehicle drawings, the most detailed we've seen, all to a very large 1:20 scale and with 1:76 scale reductions. These are really complete, with multi-views, detail views, sub-variants, and every possible scrap of information the modeller would want. So far available are a Bedford QL Army Fire Tender, Bedford 15 cwt trucks, Land Rovers (all variants including the Shorland armoured car), and the French Berliet 6 ton 'family' of military types currently in service. Readers of Mr Futter's articles in this magazine will know the type of high quality drawing to expect. They represent good value at 5s per set.

A well-known range of military drawings is put out by J. Church, Honeywood, Middle Road, Tiptoe, Lymington, Hants. Recent issues we've had cover the Mack gun tractor, Foden 10 tonner, White Scout Car, Dingo and Lynx, Karrier pontoon carrier, Humber scout car, Humber heavy utility, Crusader gun tractor, Guy 3 tonner, and Guy Quad-Ant in truck and artillery tractor forms. These drawings are all to 1:76 scale and most useful for military modellers. They are priced at four plans for 6s 4d, which is very reasonable and includes postage.

Studio 88, 95 West End Lane, Pinner, Middx, are offering numerous Michael Turner paintings (plus some facsimiles of old motoring posters), covering aircraft and motoring subjects. The two latest full colour aircraft prints feature a Hurricane and a FB5 respectively and were illustrated in a small size in last month's Studio 88 advert. These are very well done, and colourful subjects for framing. In return for a SAE, Studio 88 can supply an illustrated list of prints. **C.O.E.**



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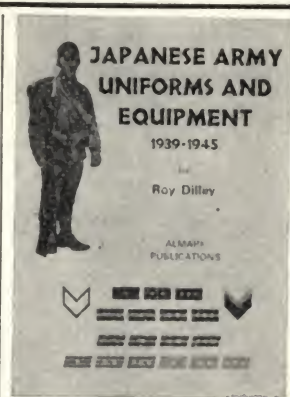
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## BOOKS A selection of books for Model Soldier Collectors and Enthusiasts:

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Uniforms and Arms of the First World War Volume (Due soon)	40/-	Uniforms, Organisations & History of the Waffen SS Regiments and Uniforms of the British Army	90/-
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Japanese Army Uniforms and Equipment, 1939-1945. Paperback 17/6, Hardback 25/-.

## FRENCH NAPOLEONIC ARTILLERY

By Michael Head, Almark Publication. This book describes in detail the French First Empire Artillery, included are scale drawings of the guns, caissons, ambulances and train wagons, plus colour drawings of uniform and badges. Paperback 20/-, Hardback 28/- Order Now for first delivery 72 pages.

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No.BN11. Private fixing bayonet	No.BN12x. Sergeant with half pike round twisting
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# Letters to the Editor

## New material

HAVING discovered a new modelling material I want to report this to *Airfix Magazine's* readers.

Although body putty is a universal modeller's material it does have several disadvantages, ie, one cannot sand it wet; without any coat under the final camouflage it does leave bright areas and it takes a long time to set. I have been looking for a suitable replacement and I discovered an entirely new, polyester-based filler, called 'Ferrofix'. It hardens completely in half an hour; you achieve a perfectly smooth surface (like plastic) after sandpapering it wet and one would not even need to apply an undercoat (it's recommended though to make any bumps or scratches visible). Perhaps it is a disadvantage that after adding the catalyst it can't be worked on after three or four minutes, depending on how much catalyst you use. In Germany, 0.25 kg cost 4.90 DM (10s). Included is postage. 'Ferrofix' is supplied by: Klaus W. Voss, Chemische Fabrik, 2082 Uetersen 1, Esinger Steinweg 50, Germany. Henner Schmude, Paderborn, Germany.

## Uniforms

I READ with interest the articles covering 'The British Army 1914-18' by David Nash, in the 1969 issues.

Readers who wish to carry out a larger variety of conversions can of course find more details at 'The Imperial War Museum' London. To those not living in the London area, a set of photographs (34) can be obtained from the museum which are very useful. They measure postcard size (5½ x 3½ inches) and cost 1s 6d each exclusive of postage. They are in black and white and are of a series of water colour paintings by A. E. Haswell-Miller. They cover the Guards, Line Infantry, Cavalry, Royal Marines, RFC and RNAS, RE, RA, Tank Corps, Machine Gun Corps and small selections of the Indian Army 1914-18. They are extremely useful as they cover both official and unofficial dress in France, Salonika, Gallipoli and Palestine. Stretcher bearers, Lewis Machine Gunners, Tank Crews; pack animals for Vickers MMG are examples of the figures covered.

Captain R. Lewis, BFPO 30.

## Jumbo colours

NOW that the first Boeing 747 for BOAC has appeared at Seattle, may I detail the deviations of the colour scheme from that given in the kit.

The wings are dark grey between the spanwise lines at approximately ¼ and ¾ chord above and below the wings. The extreme tips are silver. The rest of the wings, the wing-fuselage fairing, the undercarriage legs, bays and the inside of the doors are pale grey. The outside of all undercarriage doors is silver. Engines and pylons are silver, as are both tailplanes. The fuselage remains the same, apart from the radar nose which is not black but the normal fuselage colours extend forward to cover it. The Union Jack is positioned higher and

Letters to the Editor selected for publication entitle the senders to each receive a free Airfix plastic construction kit of their choice. We are always pleased to receive your comments and pictures, which will be considered for publication. Submitted material and pictures can only be returned if accompanied by a stamped addressed envelope, and the Editor cannot accept responsibility for safe keeping of any such contributions, neither does he necessarily agree with comments expressed by correspondents in the letters column. Please note that any letters anticipating a reply MUST be accompanied by a SAE or stamp.

further forward (over the 12th window from the nose). The letters BOAC are four feet high and are painted below the upper deck portholes in dark blue, not on the fuselage stripe. The registration of the first machine is G-AWNA, and this is carried in the usual positions. The last two letters of the registration are carried on the smaller nose-wheel doors.

While on the subject of the 747, may I congratulate Airfix on their kit. It is very impressive, although the wing-fuselage fairing and pylons appear to be a little incorrect, and need modifying for absolute accuracy.

Howard G. Mason, Ascot, Berks.

## Rib effect

WHILST experimenting with some plastic card the other week, I discovered a way to construct new wing ribs, as are needed on the Auster IV conversion (*Airfix Magazine* June 1968). My method is far quicker and, to my mind, far less messy than that of Mr. Hall.

Firstly, take the wing and sand off the existing rib detail, and polish up the wing with Duraglit (to remove any plastic 'dust'). Then cut some plastic card (I find 20-thou. best) into strips about 1" long and about ¼" wide. One of these strips is then heated in a candle flame, and when it appears 'floppy', the ends are pulled apart, stretching it. The result should be a strip of very thin plastic card about 1/32" wide.

This is cut into the lengths needed and stuck on the wing with liquid cement (Ordinary tube cement will spread and spoil the surface). When the wing is complete, give it one coat of thin varnish and allow it to dry thoroughly. When painted the effect is very realistic.

Martin Booth, West Bridgford, Notts.

## Hunter teams

IN your July issue, Roger Chesnau says '... the Airfix 'Treble One' Hunter, which, of course, represents the immediate predecessors of the Red Arrows ...'.

Not so, sir. As contemporary reports show, the Black Arrows were replaced by the Blue Diamonds of 92 Squadron in 1961. According to Harleyford's *Aircraft Markings of the World* 1912-1967, the first appearance of the Red Arrows is given as May 1 1965—although they too make the same mistake. There was a mass display given at Farnborough (1964?) by Lightnings of 111 Squadron—possibly this is what has led to confusion?

I distinctly remember a Battle of Britain display at Middleton-St-George (now Tees-side Airport) where 92 Sq Hunters (then still in standard camouflage) put on an excellent display—it was no surprise to hear of their later promotion (when 111 converted to Lightnings). Several ex-111 pilots joined 92, which then moved south to be more centrally placed for displays, and painted their Hunters all-over Royal Blue, with a silver fuselage flash.

A. G. Boak, Cranleigh, Surrey.

## Hercules details

FOLLOWING Alan W. Hall's excellent article on the HC 130 conversion in the February 1970 issue of *Airfix Magazine* I would like to inform readers that this version has now been replaced by the HC 130 N. This would be an easier conversion than the other as the nose forks are omitted and two extra tanks are fitted outboard of the engines. These are slightly shorter than the tanks in between the engines (also fitted) and shaped like those of the Bf 109G. These aircraft are based at Woodbridge in Suffolk. They are used to refuel the Jolly Green Giant helicopters (also based at Woodbridge) in flight. The colour scheme is the same as the HC 130 but 95823 appears in the August issue of *Aircraft Illustrated* with the words 'Military Airlift Command' above the main wheel doors.

I would also like to mention that in my knowledge the Sea Grey Medium mentioned by Mr. Hall in his Halifax CVIII conversion (July 70 issue) was an under-side colour and should be replaced by Ocean Grey (HB3), please correct me if I am wrong.

May I also suggest that Airfix produce a 1:72 scale Andover as a follow up to their excellent Hercules kit.

G. Thomas, Norwich, Norfolk.

## Vostok

I AM jubilant to see that at last someone has had the notion and the foresight to bring out a Russian rocket, and what an idea to incorporate into a single kit three different rockets. Revell's 1:24 Vostok is the only Russian space model available up to now, but you have brought out a rocket combined with a Vostok spacecraft in nearly as much detail as its giant counterpart.

I'm sure fellow space modellers will pronounce this kit a 'hit' and I'm also sure that they will be on your heels to bring out further space kits of this standard.

However, there is no colour scheme for the Vostok spacecraft, so for anyone who is interested: while on holiday in Spain I discovered a series of space photographs given away with beer, one such photo depicts a Vostok in a Russian space exhibition, the spherical capsule is bronze and there is a bronze band around the service-type module attached to it. The series of balls around the base of the capsule is also bronze, and the instrument section below them is dark green. As for the markings there are red 'CCCP's' painted horizon-

Continued on page 154

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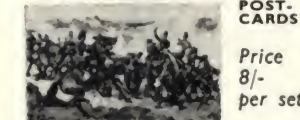
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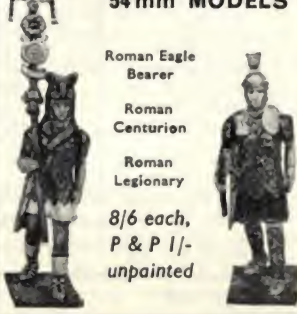
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RE1 Mounted Legate  
RE2 Praetorian Centurion, crested helmet and cloak  
RE3 Praetorian Guardsman, half armour, pili and shield  
RE4 Praetorian Guardsman, parade dress, half armour, pili and shield, cloak and crested helmet  
RE5 Praetorian Centurion, parade dress, transverse crested helmet  
RE6 Praetorian Guardsman, pili and shield  
RE6A Praetorian marching, half armour, pili and shield  
RE7 Praetorian, parade dress, half armour, pili and shield and crested helmet  
RE8 Praetorian Standard Bearer  
RE9 Praetorian (Eagle Bearer)  
RE10 Cornicier (Trumpeter)  
RE11 Auxiliary Legionary, leather armour, pili and shield  
RE12 Auxiliary Slinger with shield, unarmoured  
RE13 Auxiliary Archer, leather armour  
RE14 Auxiliary javelinman, leather armour and shield  
RE14A Auxiliary Light Javelinman with shield, unarmoured  
RE14B Auxiliary leather armour, spear and shield  
RE15 Artilleryman with ballistrajavelin  
RE16 Artilleryman with catapult stone  
RE17 Artilleryman standing  
RE18 Cavalry Officer  
REC2 Cavalry Standard Bearer  
REC3 Cavalryman, half armour, spear and shield  
REC4 Cavalryman, leather armour, javelin and shield  
REC5 Auxiliary Cavalryman with javelin and shield, unarmoured  
REC6 Cavalryman, parade dress, half armour, spear, shield and cloak

**CARTHAGE c. 200 BC**  
C1 Infantryman, half armour, shield and pike  
C6 Officer, crested helmet, leopard skin cloak  
C7 Standard Bearer  
C9 Drummer

**PERSIAN EMPIRE c. 500 BC**  
PE1 Mounted General  
PE2 Immortal, half armour, spear and shield, bow in case  
E3 Infantryman, half armour, spear and shield  
PE4 Infantryman with spear and shield and bow in case, unarmoured  
PE5 Archer firing, unarmoured  
PE6 Javelinman, half armour  
PE7 Officer  
PE8 Standard Bearer  
PEC1 Cavalry Officer  
PEC2 Cavalryman with spear and bow in case, unarmoured  
PEC3 Cavalryman, half armour, spear and shield  
PEC4 Cavalryman with spear and shield and bow in case, unarmoured  
PEC6 Cataphract, full mail with spear and shield, bow in case and armoured horse

**PEA1 Egyptian Auxiliary, half armour, spear and shield**  
**PEA2 Assyrian Auxiliary, full mail, spear and shield and bow in case**  
**PEA3 Phrygian Auxiliary, half armour, spear and shield, crested helmet and long axe, crested helmet**  
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PEAC2 Camel Corps with spear and shield  
PEAC3 Camel Corps with spear and shield and bow in case

**SARMATIA c. 100 AD**  
SAC4 Cataphract with lance (Kontos), full mail, armoured horse

**GREECE c. 490 BC**  
G2 Hoplite (for use with phalanx) with pike, Corinthian-type helmet crested  
G3 Hoplite with spear, Corinthian helmet crested  
G4 Officer, Corinthian helmet crested with cloak  
G5 Standard Bearer  
G6 Trumpeter  
G8 Archer with cuirass, attic helmet crested  
G9 Archer, unarmoured  
G10 Soldier with shield, unarmoured  
G11 Pelast with javelin, unarmoured  
GC3 Cavalryman, half armour, Boeotian helmet and shield  
GC4 Cavalryman with javelin, unarmoured  
GC5 Cavalryman, leather armour, spear and shield, attic helmet crested

**GAULS c. 60 AD**  
GA3 Officer, crested helmet, half armour  
GA4 Infantryman with spear and shield, unarmoured  
GA5 Trumpeter  
GAC1 Cavalryman with spear and shield and cloak, unarmoured

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ME/30/6 British Limber for ME/30/3 and ME/30/4 8/-  
ME/30/7 British Pontoon Wagon, 1705-1750 16/6

198 NORTHOLT ROAD,  
SOUTH HARROW, MIDDXX., HA2, OEN

THE GARRISON



tally above the front and the back of the bronze band.

Despite this lack of colour information this kit is an exceptionally detailed model and is extremely good value for money.

S. Scott, Maidstone, Kent.

### Airliner windows

ATTACHED herewith is a sample from the experiment that I have been performing recently where I found a solution to a problem involving the making of windows in models of a small scale eg 1:144 1:150 etc where perspex parts may not be provided with the model kit.

Anyone modelling aircraft such as Lockheed, Orion, Constellation, Viscount, An-10 etc may be interested to know my simple way of tackling this problem. In my case the windows of the An-12 (which I converted from a 1:150 Scale Antonov 10) were pressed in plastic and I could easily notice the position of the windows. I used letters 'O' from 'Letraset Lettering' which conform with the size of the window impression. I applied it in position to look like 'O' as in No 1 indicated in the sample attached herewith. Then I filled in the 'O' centre space with gloss black paint, Humbrol No 12, to resemble No 2 on the sample, and I had a complete round window. For square windows I used another technique. I used a letter 'H' to match the



size of the window, cut it in two horizontally till it formed a square profile of the window. This method was repeated for all the windows.

In this way I found a solution for producing a scale model complete with authentic and more realistic windows.

Carmel J. Attard, Malta, G.C.

### Iron Duke

I HAVE just completed the Airfix Iron Duke kit and would like to congratulate Airfix on at last producing a First World War ship. I have made certain modifications to the kit which might interest other ship enthusiasts. First of all I have put booms for torpedo nets along the sides. These can be made out of sprue and there are 16 diagonal booms on each side. The first 13 are at an angle of about 30°, the 14th about 15° and the last two near horizontal. These had been removed from all British warships by 1916. Another pre-1914 alteration is the top mast. I have given my model a new top mast a little over twice as high as that supplied with the kit, again made out of sprue. These tall top-masts were removed in 1915 because of improvements in wireless techniques (and because they helped enemy rangefinders). Another modification for the 1914-16 period is putting anti-rangefinding devices on vertical sight lines. For example, triangular pieces of canvas were often fitted to the funnels and sampson posts. These I have made out of plastic card. Also spiral ribbons of canvas were fixed round the top masts. For this one could use strips of metal foil or tinsel from Christmas decorations.

Anyway, I think that this is an excellent kit and I look forward to seeing a fleet of First World War ships by Airfix.

Jonathan Hill, High Wycombe, Bucks.

### 'Flipper'

WHEN reading the article on the Dakota with the needle nose in the August 1969 issue, I found that the author referred to a similar aircraft in Dutch Air Force colours.

The aircraft which is used in Holland is, of course, a Fokker F-27 Friendship, or more specifically an F-27 Mk-316M Troopship. This aircraft, serial number C-8 and constructor's number 10158, was delivered to the Royal Netherlands Air



Two views of Alan Hall's He 111 H-22 model (see page 134) showing how the V-1 bomb is mounted.

Force during December 1960 in standard Troopship configuration. During the summer of 1966 it was converted to a NASARR-navigation trainer by Fokker's subsidiary, Avio Diepen, at Ypenburg Air Force Base, during which it was fitted with an F-104G-type nose. After delivery to the Air Force it was named 'Flipper' after the dolphin in the well-known television series.

On May 7, 1968, the C-8 was hit by lightning when flying over the Netherlands and the radar nose fell clean off the aircraft. The C-8 landed safely and the nose was later found back on a piece of farmland.

Readers who wish to build a model of this aircraft can use the Airfix Friendship. The radar nose is fitted similarly to that of the Dakota as described in the article, but all the doors of the aircraft are different from those of the civil Friendship as modelled by Airfix, so that these have to be modified also. Pictures of the aircraft have, however, appeared in the aviation press from time to time.

C. M. de Lezenne Coulander, Rotterdam, Holland.

### New Books—from page 148

to most engines. The illustrations of some of the beautifully made coal-fired, live-steam models make one wish that there was at least one plastic traction engine kit on the market which could be made to represent the subject in outline and visible working parts, even if it could not be made to copy its method of propulsion. The skill and working tools of the metal craftsmen are beyond most plastic modellers but they are to be admired and very much envied. Should the book title sound familiar, it was first published in 1950 by Percival Marshall. The 1969 David & Charles edition has, however, been virtually re-written with much new material and new illustrations.

### Patrick Stephens to distribute US Naval Institute books

PATRICK STEPHENS have recently been appointed sole distributors for books published by the United States Naval Institute of Annapolis, Maryland, USA.

The US Naval Institute, a private professional association, was established in 1873 to provide naval officers with an unofficial forum for the exchange of ideas about the development and improvement of the Navy. In more recent years it has broadened its programme of service to provide professionally oriented publications for naval and marine personnel and all others concerned with sea power. These books have not before been directly available in Britain.

Among the many publications for which the US Naval Institute is famous and which will be of interest to all modellers, are such books as *Ships and Aircraft of the US Fleet* (35s), *Weyer's Warships of the World* (167s), *Flush Decks and Four Pipes* (72s),

*The French Navy in World War 2* (67s), *The Italian Navy in World War 2* (67s), *The Japanese Navy in World War 2* (72s) and many others, including a delightful volume entitled *The Henry Huddleston Rogers Collection of Ship Models* (30s) which is described as 'an illustrated guide to the million dollar collection of ship models bequeathed to the US Naval Academy by the late Col Rogers'.

US Naval Institute books will, in the near future, be available from most leading booksellers, particularly those specialising in nautical books. They can be ordered from any bookshop or direct from the publishers and distributors, Patrick Stephens Ltd, 9 Ely Place, London EC1, who will be pleased to send a full catalogue listing over 130 titles to readers of *Airfix Magazine*.

### Pictorial

AIR SCENE No 1, compiled by Philip J. R. Moyes. Published by Ian Allan Ltd, Terminal House, Shepperton, Middx. Price 12s 6d.

A NEW publication for the enthusiast, this book takes a stand on the publication of reference pictures. In fact it contains very little else and the compiler, Philip Moyes, hastens to add in his editorial introduction that the standard set in the first issue will continue. Working on the argument that there are many books of reference but all too few photographs, the first issue contains subjects like the Spitfire, Douglas Commercial, the 'Rafwaffe' Heinkel 111 and aircraft of yesteryear built by manufacturers in the west of England. The most interesting of the items is, however, a series of pictures, some, but not many, previously published on the TSR-2.

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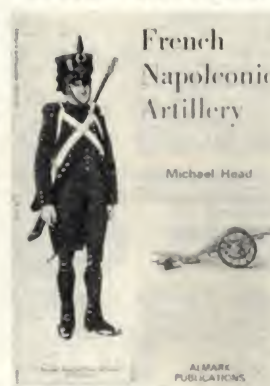
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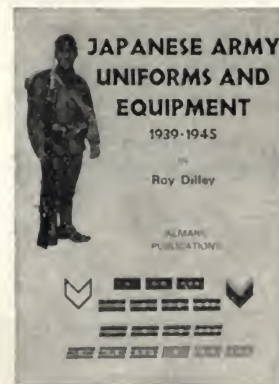
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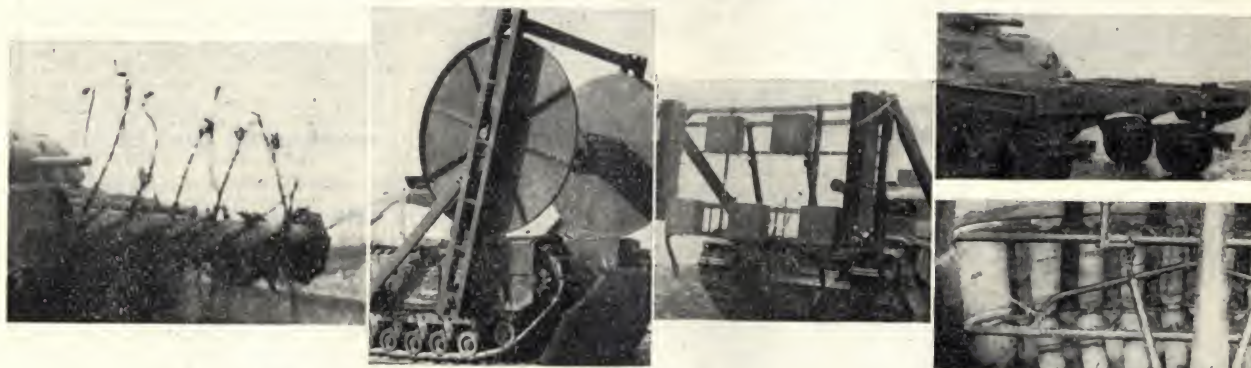
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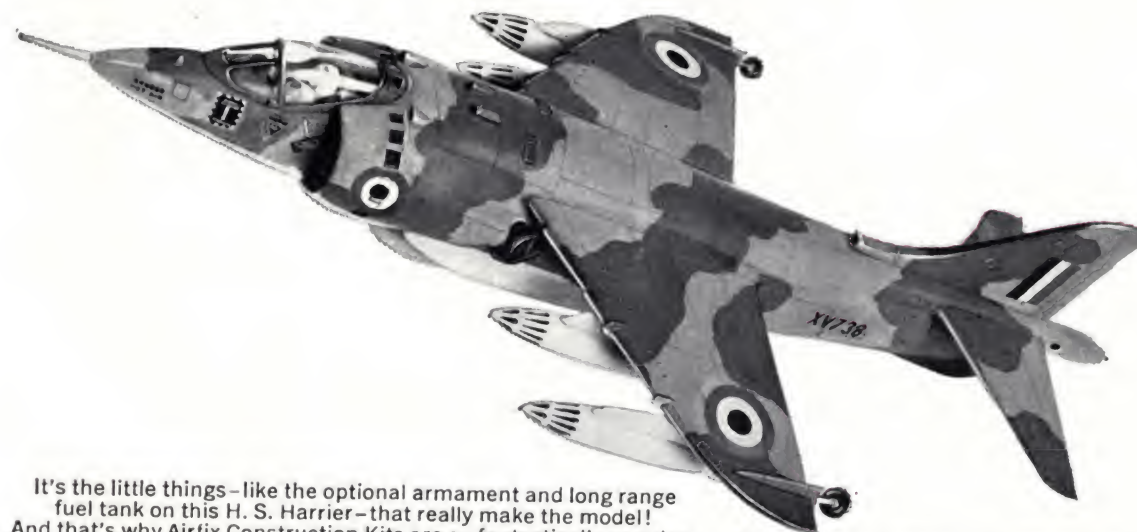
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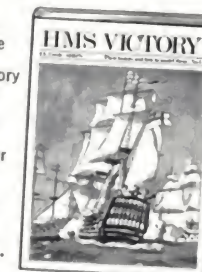
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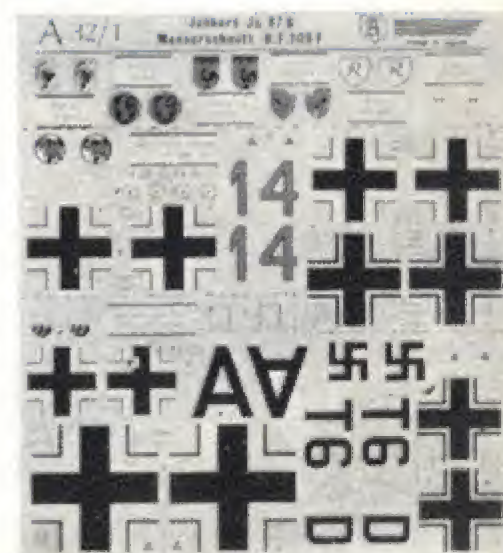
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